THE SOUTHERN CABINET.

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REPORT OF THE SPECIAL COMMITTEE OF THE ST. JOHN'S, COLLETON, AGRICULTURAL SOCIETY, ON PROFESSOR SHEPHARD'S ANALYSIS OF THE SOILS OF EDISTO ISLAND.

"*Resolved*, That the communication of Professor Shepard be referred to the Special Committee on Soils, with instructions to report, how far the analytical information it discloses, agrees or conflicts with the practice of the Planters of this Island, as exhibited in the application of their manures"

THE Committee to whom was referred the above Resolution, beg leave to report,

That the following table exhibits, in one view, the various properties of the soils* subjected to analysis:

When dried.	WATER OF ABSORPTION.	Organic Matter.	Increase in weight after being thoroughly drenched in water.	Rates of drying from a condition of saturation.	Silica.	Alumina.	Water of Absorption and Organic Matter.	Per Oxide of Iron with Car. of Lime and Phosphate of Lime.	Carbonate of Lime.	Phosphate of Lime.	Per Oxide of Iron.	Oxide of Iron and Phos. of Lime.
A	lost.											
B												
C	2.37	2.66	331.	14.0 of water.	92.57	1.70	5.03	0.70				
D	2.83	3.33	349.		91.64	1.70	6.16	0.50				
E	2.66	1.90	305.		94.00	0.94	4.56	0.50				
F	1.66	1.75	293.	11-0	95.00	0.79	3.41	0.80				
G	2.53	2.16	325.		93.00	0.81	4.99	1.20				
H	2.36	2.41	315.	12.0	93.23	1·05	4.77		0.35			0.60
I	11.36	8.23	480.	28.7								
K	14	9.68	605.	39.0	61.75	9.00	23.66		0.29	.30	5.80	
Pure Sand			235	6.8								

With regard to the cotton crop, F is the poorest in production; H, the best. The former, whose capacity for water is the least, is distinguished by the smallest quantity of organic matter; the latter contains comparatively a large amount of carbonate of lime. The following is the relative order of the soils in reference to fertility: H, C, G, E, D, F. Further information, concerning the question propounded by the Society, will be furnished in the sequel of these remarks.

The interesting inquiry in relation to the food of plants, is still unanswered. The earliest theory on this subject, emanating too, from practical men, was in favor of decomposed organic substances. Whilst one, skilled in the science of vegetable physiology, pronounced water,

* Although the samples were taken from one plantation, yet, it is believed, that they afford fair specimens of the soils of the Island, except those which produce "blue cotton." A, B, I, K, were mud samples.

another oil, and a third pulverized earth, as the great desideratum. Dr. Priestly insisted on phlogiston, and Kirwan on charcoal, as the true aliment. The elements of vegetables are few and very similar. The most essential are oxygen, carbon and hydrogen. The various combinations of these elements make up the varieties of the vegetable kingdom. In like manner, the general soil consists of few elements; of which silex or sand, alumina or clay, and lime, carbonic acid, nitric acid, sulphuric acid, and iron, are the chief earths, acids and minerals. These substances, which are united in various degrees, produce the numerous modifications that characterize soils possessing the same constituent principles. The atmosphere,* it is well known, is composed of the two gases, oxygen and azotic or nitrogen. Whilst plants, which derive nourishment, as well from the air by inhalation of their leaves, as from the earth by absorption, excrementitiously throw off the oxygen, which is necessary to animal life, they render the nitrogen fit for respirable air by decomposition: thus contributing by a two-fold operation to the perpetuation of every created thing with which the earth abounds. Modern writers seem to concur in the belief that, although plants need a variety of soils, adapted to their constitutions, they perhaps require no specific nourishment, each species being endowed with the capacity of converting food to the sustaining of life; in other words, that substances of every description, whether solid, fluid or gaseous—that light, caloric, gravitation, attraction—all were designed as necessary agents in the formation of the great family of vegetation. It is nevertheless true, that the primitive earths in their pure state, or when mixed in proper proportions, are barren;† further, that the living fibre is composed of what was originally living fibres—and that in decomposed animal and vegetable matter every constituent‡ is embraced, which theorists have successively maintained is the food of plants. Be this as it may, it is certain that for any substance to constitute aliment it must exist in a soluble state, to be reduced to which, air and moisture are indispensable. Hence, by breaking up and frequently stirring the ground, the great object of tillage is effected. But these natural agents are alone incapable of converting all the insoluble matter of a soil into geine.‖ To accomplish this purpose, the aid of artificial stimuli is necessary.

The soils of the Sea Islands are alluvial, or the result of the deposition from rivers. The productiveness of alluvium is ascribable to the finely divided matter of which it is composed. By freely admitting air and moisture, geine, which the Massachusett's chemist maintains is the pabulum of plants, is quickly produced. The ready solubility of organic substances in a sandy soil, from the cause already assigned, is the reason

* See the second Note on p. 458.

† See experiments of Giobert. Loudon's En. of Gard.

‡ "All animal substances are resolvable into hydrogen, nitrogen, oxygen, carbon, phosphorus and sulphur. Dung, or the mixture of animal and vegetable matter, contains all these."

‖ "Geine is the decomposed organic matter of the soil. It results chiefly from vegetable decomposition. Geine is either soluble or insoluble. The latter is converted into the former by the action of lime. Acting neither as an acid nor alkali, it is converted into a substance having acid properties by the action of alkali, and in this state combines with earths, alkalies, and oxides, forming neutral salts, which may be termed geates. Soluble geine is the food of plants."—*New Method of Analysing Soils, by Dr. Sam. L. Dana of Lowell.*

why manures have so speedy an effect; at the same time it accounts for their evanescent character. Chemical tests, however, are not always infallible guides for the cultivator. To perfect the work in which science invites him to engage, minute examinations on his part are clearly called for. Successful tillage is influenced materially by the depth of the mould or crust of the earth, and the nature of the subsoil. The cotton plant has a long tap-root, which penetrates always, unless of a very wet season, or some obstacle intervenes, below the soil.

It requires no argument to show that, if the product of a crop mainly depends on the quantity of food with which it is supplied, the deeper the mould, the great laboratory of nourishment, the more abundant will be the harvest. Again, two soils may agree in every material point in their elementary parts, yet, in production, will be very dissimilar. The difference is traceable to the subsoil. By the influence of an absorbent, clayey substratum, sandy lands are rendered prolific, whilst without this mechanical assistance they might have remained in comparative sterility. So, the fertility of a clay soil, obviously too retentive of moisture, may be owing to the sand or gravel on which it stands. The soils which are of a good depth, and rest on a clay foundation, are decidedly preferred for the cotton crop. The black, or flat dark grey lands, as they are generally wanting in one or both of these important agents, cannot be relied upon. This is probably the true explanation why F and D, under no system of management, have yet repaid the labours of the cultivator. Distinguished as H is in both of these valuable properties of the best cotton lands, its superiority is at once in part accounted for. In fine, it would not be hazarding much to say, that production, so far as the principle of mechanical agency is involved, depends as much on depth of soil, and the nature of its substratum, as upon the proper admixture of the earthy parts of the soils themselves.

The samples analyzed are described as being uniformly sandy, containing in one hundred grains over ninety-one parts of silica. Although in them there are only "feeble traces" of the carbonate of lime and of the sulphate of lime, yet, it must be remembered, that a small fraction only of either enters into the composition of plants; and that "a crop may fail from the want of a single grain in a hundred of those elements."* The amount of organic matter is small, though not remarkably so, for all alluvial soils, it is believed, are wanting in this respect. The almost entire absence of calcareous earth was unexpected. In the prosecution of their duty, having been led to examine this subject, the Committee find, what indeed is a striking fact, that the soils of America, unlike those of Europe, are very deficient in this substance, some of the latter containing over 50 per cent. and nearly all of them a large per cent. "Out of one hundred and twenty-five specimens of soils from all parts of Massachusetts, and several of them from lime-stone regions, only seven," says Edward Hitchcock, professor of chemistry in Amherst college, "exhibited any effervescence; and even these, when analysed, yielded but a very small per cent. of carbonate of lime." The same writer remarks, "I have recently examined five of some of the richest soils of Ohio and Illinois, and although I find calcareous matter in all of them, yet the average quantity is not over 2 per cent" A similar statement has been made respecting the soils of Virginia, and of some of

* Assertion of the late Timothy Pickering.

the western states, even in limestone regions, by Mr. Ruffin, the able editor of the Farmer's Register.

"May not the peculiar fertility of new Sea Island cotton lands," asks Professor Shepard, "be owing to the proportions of comminuted shells natural to such soils, and the deterioration of these lands under long cultivation, ascribable to the exhaustion of carbonate of lime?" To the latter query the Committee would answer, that chemical tests prove that, in the formation of plants, as already noticed, the quantity of lime taken up is very inconsiderable. This, superadded to the acknowledged fertility of our western lands over those of Europe, is strong evidence, that the productiveness of soils does not depend upon the amount of calcareous matter, but that a small per cent. only is necessary. The Committee are unable to see how any soil can be deprived of its calcareous constituent, which does not at the same time lessen the quantity of all its earthy ingredients. Lime is one of the primitive earths. It cannot, therefore, take a gaseous form, nor can its nature be changed. If there was a time when our soils contained more of the carbonate of lime than they do at present, it follows that, as lime is indestructible, it must now exist in some other state of combination than the carbonate: perhaps in that of the oxalate of lime, a powerful promoter of vegetation. If so, the exhaustion of the carbonate of lime is not one of the causes of the present deteriorated condition of the Sea Island cotton lands.

Acquainted as we now are with the main defects of our soils, the important question is presented, how are they to be amended? Before an answer is given, the Committee would briefly advert to two prominent errors in our system of husbandry, under which we have long laboured.

1. The keeping of large stocks. The plantations of the Sea Islands are small. About one half is cultivated annually—the remainder is allotted to the support of domestic animals. In autumn, looking only to the spontaneous production of the earth, a cheerless waste is exhibited. As bountiful to the southern planter as nature invariably is, where overdrafts on her munificence are never made, her resources at that time become exhausted, and the offal of the gathered crop furnishes the only means of conducting his stocks safely through the ordeal of winter. Accordingly, for two-thirds of the year, they furnish neither milk, butter, nor meat, for the ordinary consumption of the plantation; and, at no time, are they capable of profitably promoting any of the ends for which elsewhere they are so justly celebrated. Engaged as we are in the culture of one of the most valuable commodities in the world, the raising of cattle for sale is prohibited by the common dictates of prudence. For their manure and for table use alone are they considered worthy of attention. To subserve these purposes, a small number only, especially of sheep, is necessary. The pursuits of the grazier and ploughman, if in the attainment of their ends, they respectively depend upon the same grounds, are in direct collision. Both cannot succeed unless at cost of labour and of time which would soon annihilate their profits. If the former prosper, is not the husbandman thereby deprived of the natural food for his plants? If the latter hope for a lucrative harvest, it can only be effected by circumscribing within very narrow limits the pasturage of the grazier. The injury sustained by the *depredations* of stocks, according to our present improvident plan of husbandry,

may be ascertained with some precision. As a preliminary suggestion, it may be remarked, that the sheep has an insatiable appetite. If not gratified, in the strong language of "Arator," he dies; if it is, he depopulates the country. Liable to numerous diseases, he has never been a lucrative object where tillage was the main support of the people. He is reared too at a much greater expense than the cow, and furnishes for the table perhaps not one-fourth of the food which is provided by that useful and hardier animal. Each head of black cattle annually keeps bare of grass, in ordinary seasons, about two acres of ground, and each head of sheep, perhaps three acres. Now as the land, where this system of unrecompensed pillage is carried on, is designed by the owner for his crop of the following year, it is fair to conclude that, as the planter is engaged with his whole force between two and three months in collecting putrescible substances to supply the place of the food which the tooth has destroyed, a large portion of that time is in effect appropriated to the support of his cattle. Were their number greatly reduced, probably only one-half of the manure which necessity now obliges us to procure, would be needed; that is, if we be satisfied with the present amount of artificial fertilizing matter—otherwise, we could duplicate the quantity now gathered. When we look at the poor and degenerated condition of our stocks, the denuded state of our pastures, and connect these with the startling truth, that, in despite of apparently well directed efforts, our lands in regard to their productive powers are stationary, if not retrograding; the conclusion is irresistibly forced upon the mind that, in furnishing the domestic circle with some of the necessaries of life, a price is substantially paid equal to the joint labour of the planter and his slaves for one or two months. If an ample supply of the best meats and the comforts of the dairy be an object of importance, a small stock only will furnish it. If to add to the amount and improve the quality of manures be desirable, look to the same source; for English authorities, sustained by the undivided opinion of the New-England farmers, assure us, that ten well fed cows produce more manure and of decidedly more enriching properties, than fifteen whose allowance has been stinted. Should a larger provision in vegetable aliment be sought for, let not the tooth and the hoof thwart the efforts of nature to aid us. From facts in the possession of the Committee, and from careful observations, they are led to think, that ten head of black cattle and four of sheep to every hundred acres, would be about the true proportion for our arable lands.

2. The culture of too much land for the force employed; and, as a necessary result, insufficient manuring. It is known to the grower of cotton, that his harvests are rarely gathered from the whole crop, but only from those portions where the soil is naturally productive, or where a large amount of proper nutriment is applied. The number of acres cultivated to the hand is from three and a half to four. The usual quantity of compost manure per acre, which the unceasing labour and perseverance of the planter have as yet enabled him to furnish, is from twenty to thirty cart-loads. Is not this too meagre an allowance? The substitution of quantity for fertility is indeed an exhausting operation, without a single principle to recommend it. To provide abundantly, therefore, for the wants of our soils, rather than to deprive them without reciprocation of their natural ingredients by too extended cultivation, is demanded by the weightiest considerations. The Committee will not

comment on the saving of labour and of time, now in a great measure unprofitably expended—or the great facility of attending a small crop—or that thereby the planter may have it in his power to adopt in part the enclosing system—or at least to allow his lean and dwarfish animals more and better food; but they will assume the impregnable position, that a given quantity of decomposed organic matter to an acre on exhausted land, will yield a larger return than if the same had been placed on one and a half or two acres. The history of agriculture and of horticulture in England and America bears ample testimony to this interesting fact, and perhaps on no question in husbandry are writers so well agreed. Without bringing to the notice of the Society the mass of evidence in confirmation of this proposition, concerning, however, the numerous crops that are elsewhere raised, they would at once, as having a direct relation to the object of their solicitude, state the results of only three among many trials made on this island. The last season a member of this Society used on an acre of good ground eighty-four cart-loads of marsh and mud—the former greatly preponderating. From it he gathered three hundred and ten pounds of clean ginned cotton. His general crop yielded about one hundred and ten pounds per acre. In 1832, another member directed his overseer to double the usual quantity of manure for a few acres, which were marked by the usual indications of sterility. Indeed they were in appearance so extremely poor, that the cotton plant, through their agency, could scarcely be said ever to have reached the point of fructification. From some misapprehension, the orders of the owner were exceeded, and the unprecedented amount of eighty-four cart-loads of mud and eighty-four of compost to the acre, was applied. The product was not only as large as that of any other portion of his crop, but, although eight years have since elapsed, the field so bountifully assisted at that time still displays its gratitude to its cultivator by the abundance of its fruits. In 1837, one of the Committee, in order to ascertain, whether an unusual quantity of compost manure was unfavourable to the production of cotton, or had any effect in bringing about a new growth in the plant, tried the following experiment. On twenty-four acres of high, sandy land, a part of which was very light, there were put about twelve hundred ox-cart-loads of well rotted substances, (of which marsh formed the principal part,) from the stable and cattle pen. These were thrown broad-cast, and the land immediately listed. The rest of the crop received of compost twenty horse-cart-loads per acre—or of mud, fifteen cart-loads—of marsh, five cart-loads. The spring was cold and wet, and from three gales of wind great injury was sustained. Early in August, all of the cotton, *except the twenty-four acre field*, took a second growth. *That* suffered in no respect, save from wind. It matured very rapidly, and the yield was over two hundred pounds to the acre. The remainder of the crop, except H, from which was picked about one hundred and twenty pounds per acre, produced on an average fifty-five pounds to the acre. In reference to these and other instances of large returns from increased quantities of manure, it has been said, that three and a half or four acres to the hand cannot be assisted to the same extent. Granted. But may not one half or perhaps two-thirds of that number be? If so, the path of our duty is plain. If the owner of thirty labourers makes annually two thousand cart-loads of manure, is it better that that amount be placed on one hundred acres, or on seventy or eighty acres? That is the

question to which a thousand well directed experiments, and every year's experience on our part, are ever ready to reply. The Committee will conclude their remarks on this head, by recommending, that the practice of an equal division of our plantations be continued, but that only two and three-quarters or three acres to the hand be hereafter cultivated. In this way, there will remain in every enclosed field probably a large space of ground, which, in effect, will be an addition to the landed capital of the planter.

The ill success frequently attendant on compost manure, arises chiefly from its improper distribution. Instead of being strewed in the middle of the alley, it should be used *broad-cast*. In no other mode can it be thoroughly incorporated with the soil. By the old practice, cotton suffers in drought from the heating effects of the mass through which the tap-root passes. In sudden wet after dry weather, the excess of stimulus, which the plant from the position of its trunk is obliged to imbibe, deranges its functions, and brings on disease, and hence a shedding of its fruit.

Whether manures should be put on or under the listing, is yet an undetermined point. In this section of the State, the latter is considered the preferable plan. Manures are lost by evaporation and infiltration. If to the gases belong their more active ingredients, it follows, that under the listing is their proper place; if to the salts, then they should be covered very shallow. Manures near the surface certainly promote the growth of our staple crop, when young, to a greater degree than where deeply buried; and as the season of spring is now invariably cold, it may not be an injudicious method. Every attentive observer, however, no doubt has remarked, that the result is in favour of the manures below the listing. The product of cotton, in the few instances known to the Committee, being greater, though the plant itself was not always taller. From this an inference may be drawn, that the manure, which from its proximity to the surface, first displays its power, is the first and the soonest eventually to part with it; in other words, that by evaporation the greater loss is sustained.

The Committee are now prepared to invite the attention of the Society to the following means of renovation, which, if discerningly used, may be instrumental in restoring to our soils the vegetable matter of which it has been deprived by a long course of mismanagement. For the sake of convenience, they will be denominated positive and negative means, and first of the latter,

ROTATION OF CROPS.

On this subject there are two theories. 1. That whilst the continuous cultivation of any one crop deprives the soil of the specific aliment essential to its fructification, another plant, requiring some other food, may be advantageously substituted. 2. The celebrated botanist, De Candole, says, "of the nutriment which vegetables receive and digest, they exude an inconsumable or innutritive portion by their roots. This excrementitious matter is supposed to unfit or poison the soil for a second crop of the same kind, until it is either consumed or neutralized by cultivation." May not this be the true reason why it is so difficult to "set cotton" on land planted for three or more consecutive years? As soon as the plants recover from their sickly state, and this takes place when the poisonous substance discharged from their roots is destroyed

by tillage, the crop grows as vigorously, and the product is usually as good as on rested lands, where the same amount and kind of artificial nourishment have been applied.

The soils best adapted to cotton are cultivated every alternate year: the low, black, or dark grey lands, being appropriated to corn. Guided by the lights of experience, it may with confidence be stated, that the two crops cannot, under any circumstances affecting seasons or management, profitably succeed each other. If, however, in the enclosed field, there be any number of acres suited to the raising of cotton, not desired to lie fallow, the sowing of oats, rye, Indian corn in the drill, but especially peas, is strongly recommended. Whether the benefits of the two first proceed from the levelling of the ground, or that the quantity of nutriment is greater than that arising from grass and weeds, is unimportant; it is enough to know that the soil is thereby very considerably improved. Peas, called by an old planter of a sister state, the clover of the southern country, where an accession of vegetable mattter is the primary object, should be put in the ground early *in April* and hoed but once or twice. A small product only will be the result. The growth of grass, however, which at a late period will be more than ordinarily abundant, with the increase of the leaves, stems, and ungathered portion of the pea crop, (seed only being saved,) will give double the amount of soluble substances, which, if the land had been at rest, it could have produced. Peas sown in August is not an amender of the soil, unless ploughed in immediately before the period of ripening. Cotton after potatoes, allowing one year to intervene, succeeds well.

PLOUGHING IN GROWING VEGETABLES—SUMMER OR FALL LISTINGS:

The former operation has been practised since the days of ancient Rome; and although there is much contrariety of opinion as to the time when vegetables should be restored to the earth, yet all agree that the process, either in a green or dry state, enriches the land. Dr. Dana is certain that "dry plants give more geine than green." Sir Humphrey Davy remarks, that "all green succulent plants contain saccharine or mucilaginous matter, with woody fibres, and readily ferment. When they are to be employed for enriching a soil, they should be ploughed in when in blossom, for it is at this period that they contain the largest quantity of easily soluble matter, and that their leaves are most active in forming nutritive matter." The experience of the best farmers in the eastern states seem to favor the views of the American chemist. Should the land be inclosed, it would be advisable to postpone listing it until autumn. The observation concerning the time when peas should be turned in, is equally applicable to oats, rye, and Indian corn, in the drill. The first is ripe in June, and the last attains its full growth, (it never bears fruit,) about the middle of July. It is then not too late for the earth to bring forth abundantly of her natural resources.

If pine trash, rushes, or other matter, difficult of fermentation, be designed to be used, its incorporation with the soil at an early a period as possible is recommended. Planters object to summer listings, because the sward being removed, the ground is exposed to the direct action of the sun, and thus evaporation is increased. This in part is certainly true. It was formerly the practice in northern countries, in order to insure rest to lands in the producing season, to prevent them by repeated ploughings from yielding any thing. This is known as the

naked fallow system, which, on scientific principles, is erroneous. By an uncovered surface evaporation is not only augmented, but it is rendered greater too in proportion to the levelness of the ground. Even a partial cutting down of the beds, therefore, on which the last crop was raised, will, to the extent to which it is carried, aid in extracting from the soil its nutritive properties. It is important, however, in this inquiry to remember, that the tops of the old ridges are in general bare, and that in removing from them only earth enough to effect a slight covering of the vegeteble matter placed in the alleys, the injury arising from the escape of the gaseous effluvia cannot be materially increased. If, nevertheless, this inference be not correct, it will detract but little from the proposed plan of amelioration.

Although the Committee cannot concede the position, that the atmosphere is the great matrix of manures, yet, it is undeniable, that plants do derive a very large portion of aliment from that source. On this principle is founded the system of deep ploughings. By it not only the soil but the substratum, if exposed a due length of time, will receive the salutary influence of the atmosphere. In reference to the immediate topic of consideration, the gases which the partial decomposition of the vegetable substances, only in part buried as proposed, might emit, are necessarily taken up by the growing herbage, or crop, if one be subsequently sown, and by this means their valuable agency is retained and extended. The objections consequently to summer listings, unless done too late for the earth to give a coating of grass, do not in theory possess that weight to which it is thought to be entitled. In practice, the plan, it is experimentally known, where rushes or pine-straw is used, is decidedly proper. The breaking down and softening the woody fibre, and thus preparing it for the process of fermentation, is the important point which is gained. It is asserted too that, in this way, the dertruction of bugs and other insects, or their eggs, may be effected. The frosts and rains of winter will further the progress of the good work. It may not be unimportant to state that, if the listed land be inclosed, that part of the surface which is exposed may be soon shaded by sowing the common field pea. Evaporation will thereby be prevented, and an useful addition made to the store of vegetables.

THE ENCLOSING SYSTEM.

To whatever extent the industry, skill, and resource of the planter may enable him to provide for the improvement of his lands, it is not probable that, according to any known scheme of management, he will ever succeed in furnishing an impoverished soil with the quantity of aliment its wants really require. The planters of this Island do annually manure every foot of ground which is cultivated in cotton; and, it may be added, in provisions too.* Still the amount of food per acre, apparently large, is far short of what their interests would invite them to apply. They cannot succeed in returning to the soil even for one year perhaps the one half of the nutriment originally furnished it by nature. Other means of melioration then must be resorted to. Clover and plaster are not adapted to our climate, and no foreign or domestic grasses have yet been substituted for them. The enclosing system, therefore, strongly

* To accomplish this, one cart to every five labourers is necessary.

invites our notice. To adopt it in part, which only is practicable, the planting of less ground for the force employed, and the keeping of smaller stocks, will of course be measures of necessity. All enemies to composts on scientific principles, (and in this class are comprehended many intelligent farmers, or those who have failed in the application of them,) seem to coincide in the belief, that the enclosing system offers the readiest mode of returning to the soil the organic matter of which repeated croppings may have deprived it. It especially recommends itself for its saving of time and money to the planter, and of labour to both man and beast. In order, however, to reap its full benefits, the land should be levelled in the fall, and in the following autumn listed for a crop. "To draw from the atmosphere* the greatest quantity of manure, to check the loss the earth sustains from evaporation, during the process of shade, to give the manure the most lasting form, and to deposit it in the most beneficial manner, are," in the language of Col. Taylor, "the primary objects of the enclosing system." The objection to Arator's theory, in its most comprehensive sense, is, that, in the creation and sustaining of vegetable life, the earth is made to play a subordinate part—nay, that it is the mere home of plants, without the ability of contributing to their subsistence. If nothing is nourishment to a vegetable but what enters into the permanent composition of a vegetable, the conclusion is irresistible that, as all plants on analysis yield an earthy product, and the product is found to partake most of the earth that predominates in the soil, producing the analyzed plant, earth is necessary to plants as food. But air,† however, as essential to vegetables, is conceded. A seed deprived of air will not germinate, and a plant placed under an exhausted receiver, will soon perish.

OF POSITIVE MEANS OF MELIORATION—MANURES.

Manures may properly be divided into three kinds—manures of nourishment, manures of stimulus, and mechanical manures. Of the first the Committee have already spoken. In relation to the second, it may be remarked, that whatever substances enable plants to digest more than under ordinary circumstances they could consume, and accelerate decomposition, are manures of stimulus. Hence the efficacy of salt, lime, gypsum, &c. Mechanical manures are those which effect modifications of the component earthy parts of soils, by which they are enabled to increase or diminish their absorbent powers. Of this description is the addition of clay to sand to make it more retentive, or if sand to clay to lessen the tenacity of the latter.

The long mooted point concerning the relative advantages of long and short muck, has been settled by a series of experiments instituted by scientific men. Short muck will give the best crop the first year; long muck, the second. In regard to cotton, the former is preferred, because

* The experiment of the willow—planted a slip in a box, containing two hundred pounds of earth, and at the end of a few years, exhibiting a tree of two hundred pounds weight, without having diminished the earth in which it grew, demonstrates the power of the vegetable world to extract and to elaborate the atmospherical manure. —*Taylor's Arator.*

† Priestly first, and Lavoisier after him, analyzed air, and found that when pure, it consisted of about seventy parts of azote, twenty-seven of oxygen, and two of carbonic acid. In its ordinary (or impure) state, it is loaded with foreign and light bodies, such as mineral, animal and vegetable vapours, the seeds of plants and the eggs of insects. It is to this *aggregate* that vegetation owes the services rendered to it by air.

its early efficacy is indicated in the production of cotton fruit—because, the plant being rarely over-stimulated, the inevitable result where fermentation is too rapid, a new growth is prevented—because, by the use of the latter, the looseness of the soil is increased, and the escape by evaporation of carbonic acid* with ammonia is of course materially assisted—because, as our fields are planted every alternate year, no advantage would accrue from long muck, except to the grasses, even if it be true, that its effects are more decidedly beneficial the second season. Decomposition, it ought distinctly to be remembered, should not be carried so far as to present only a black mass, without heat or smell.

COTTON SEED.

This is undoubtedly a manure of nourishment. Its value is derived from its oleaginous property, as all oils are composed of carbon and hydrogen. On high lands, from four to six quarts of *live* seed to the task row, (one hundred and five feet,) where the ground has received a coating of mud, at the rate of forty cart-loads per acre, may be relied upon with perhaps more certainty for cotton, especially of an irregular season, than any other application. If used alone, a half-bushel, or even a less quantity, should the land be not too poor, is the proper amount. For dark soils, it is thought no manure answers better, particularly if combined with marsh-mud. To corn, from one peck to a half-bushel to the row, *below* the list, it is of greater benefit than three bushels of the best compost.

MARSH.

In a green state from twenty-five to thirty cart-loads per acre ought to be applied. If decomposed, a smaller quantity may be used. Autumn, or early in the winter, is the proper time for turning it into the ground. It is an advantage to all soils, but especially to those of a black, or dark grey colour. Listing it, in the summer is often attended with the happiest consequences. Where this is done, it sometimes happens that, in light lands the cotton-plant becomes "blue." It is hence advisable to postpone imbedding it until a later period.

RUSHES AND PINE TRASH.

Both of these vegetable substances need artificial aid to convert them into geine. By the usual processes of nature, they are scarcely brought to a completely soluble state in two years. By being buried in summer, as already advised, they do excrcise nevertheless a material influence on vegetation; and this arises, in reference to the first, from the decomposition of the mass of spongy matter which at that time is contained in the body of the plant; secondly, from its saline properties and its attraction for moisture. With the constituent parts of pine trash the Committee are unacquainted. In a drought, put around corn, it will revive it and restore its greenness of colour as quickly as salt. It is known too, to our most experienced planters that, if used alone, its efficacy is only apparent on light and dry lands. From these facts the inference is drawn, that it ministers to the growing crop by collecting

* Carbonic acid is formed and given out during the process of fermentation, and makes twenty-eight parts of one hundred of atmospheric air. It is composed, (according to Davy,) of oxygen and carbon, in the proportion of thirty-four of the former to thirteen of the latter.

and retaining moisture. Another reason why, if undecomposed, it should be covered in summer, suggests itself. It is believed, that pine straw contains an acid principle, which in time, through the agency of the calcareous matter of the soil, is neutralized. By being thrown into a litter-pen the same effect is produced.

MARSH-MUD.

This is not a manure of nourishment, where marsh itself is not combined with it. The evidences on this head is conclusive, as it does not but very slightly increase the growth of the cotton plant. From the analysis of Professor Shepard, it seems to contain more valuable properties of a permanently beneficial kind than any other natural compound. The great disparity between I and K, and the other analyzed specimens, in regard to the water of absorption, to organic matter and alumina, shows, that by marsh-mud, judiciously gathered and applied, the amending of our lands, though the operation will unquestionably be gradual, may confidently be relied upon. The differences of opinion as to the utility of this manure, arises solely from the difference in the component parts of the substance itself. Frequently, in the immediate neighbourhood of each other, samples are drawn wholly dissimilar in many essential respects. I and K were taken from the same bed, and only a few feet apart, yet one has ingredients of which the other is entirely deficient. As it is important to add to its highly useful and efficacious powers the desirable quality of contributing directly to nourish the cotton plant, the surface of the mud-bank only, containing as it does much vegetable matter, should be dug. The more tenacious the quality, known by its strongly adhering to the hoe, the better, if its mechanical effects are wanted; the lighter, when dry, the greater is the quantity of vegetable aliment of which it is composed. It is for this reason that turf-mud is as highly (if not more) esteemed, as any other description, except that perhaps in which comminuted shells are found. Dry mud, although by exposure it will lose its carbonic acid, which, however, is in general very inconsiderable, has been experimentally proven to be decidedly more useful than when wet or newly taken up. In the latter state, it is incapable of intermixing with the soil. If the fertility of earths depends on the firmness of their particles, the favourite theory of the celebrated Tull, a mass of hard matter, though it be alluvium, cannot contribute materially to the fructification of plants. Of a very dry season, wet mud is known to be valuable. This arises from its saline ingredient, which keeps it always moist.

It may here be appropriately observed, that if the rotation system be a judicious means of improving lands for cotton, the alternation of manures is equally advisable in increasing the product of the crop. The change from mechanical and stimulating to manures of nourishment, has given the most favourable results. There is no doubt that, after perhaps the first year, when a cart-load of mud to the task-row is necessary, one-half of that quantity will produce all the effects which would be expected from the use of a larger amount. Although it may not be true with regard to other manures, yet it is undeniable, that lands seem to tire of marsh-mud after three or four *consecutive* applications. This probably arises from the soil possessing, at the end of that time, a sufficient portion of all the nutritive properties, which, as far as this substance is concerned, are essential to the procreative powers of the

cotton plant. The addition of more mud is consequently not only unavailing, but perhaps from its very excess operates disadvantageously. The generating cause of the "blue disease" in cotton is unknown. The remedy fortunately is no longer one of the arcana of nature. Plantations, which at one time bid fair to impoverish their owners, are now by the free use of mud, among the most profitable. The individual who first in practice developed the fertilizing properties of this inexhaustible compound, is entitled to all the honors which are due to benefactors of their country.

SALT.

Sir John Sinclair, in his treatise on this subject, says, "salt employed in large quantities, in its natural state, is hostile to vegetation, yet it operates advantageously in various ways when judiciously applied to arable lands. In large quantities it has a tendency, like every other excessive stimulant, to disorganize and destroy the vegetable substances with which it comes in contact; but in moderate quantities, it promotes the growth of vegetables." Arthur Young observes, "that the application of sea-water to vegetables generates putrescent hepatic gas, caused by the mixture of vegetable juices with the vitriolic neutral salts contained in sea-water. Muriate of magnesia, forms one-fourth of the saline matter of sea-water. Very considerable benefit has been experienced from its use in promoting vegetation, when mixed with dung or compost dung-hills. It possesses a septic power that promotes putrefaction." The Chinese make use of sea-water as manure near their coasts. In the interior they scatter salt over their fields before they are tilled. The same practice is pursued in Hindostan and by the Milanese. From the time of lord Bacon, sea-sand, the principle value of which lies in the salt with which it is impregnated, has been extensively used, where obtainable, in nearly all the countries of Europe. In 1819, it was given in evidence before a committee of the House of Commons, that there is always a violent strife among the farmers of Cornwall for the largest share, whenever the refuse salt, used in curing fish, is for sale. The money laid out in Cornwall, and the adjoining countries, for sea-sand, amounted, one hundred and ten years ago, to £32,000: and so much has the practice increased, says an English writer of 1820, that the expense of land carriage for sand, used as a manure in Cornwall alone, now amounts at least to £30,000 annually. All the authorities to which the Committee have had access, unite in the following testimony:

1. In small quantities salt has septic properties; in large quantities it is an antiseptic, or counteracts putrefaction.

2. It attracts and retains moisture.

3. In relation to corn, Irish potatoes, barley, hemp, flax, and many other crops, its benencial influence is beyond dispute. For grass lands, especially in dry and hot summers, no application is represented to be better. It is a preventive to the blight and mildew in wheat, and effectually destroys all noxious weeds, grubs, worms and insects. As salt is a stimulant, it should of course be mixed with animal or vegetable substances, and never used alone. It is known to the Committee, that if incorporated with the compost heap, or the organic matter buried with the sward, it will not only increase the productive power of cotton, but preserve its health and bring it early to maturity. The quantity successfully tried on this Island, has varied from one pint of clean Liverpool

salt to a quart, to the row, on the listing, or from two and a half to five bushels to the acre. A larger amount, checks the growth of cotton, and hence operates injuriously on poor soils. For grass lands, six bushels of foul salt to the acre are recommended; and as one of the means of preparing grounds for the usual crops in northern countries, sixteen bushels per acre, it appears, ought to be used. When mixed with ashes, lime or soot, its meliorating power is greatly increased.

ANIMAL MANURE.

The following analysis, by Kirwan, is worthy of especial notice:

		CHARCOAL.	LIME.	CLAY.	SAND.	FIXED SALTS.	CARB: HYD. CARB: ACID AND WATER.
105 lbs. of Cow-dung,	give	3 75	1 20	0.15	2.4	0.6	92 80
" " " Horse "	give	10.02	1.50	0.50	3.0	0.21	89.77
" " " Sheep "	give	25.00	10.28	29.00	29.0	0.72	68.00

The vast superiority of the last is very manifest. Let not this, however, mislead the judgment of the planter. The ordure of sheep, maugre its intrinsic value, is the most costly manure, when the food that animal consumes is considered, that is now used.

The English practice of strewing animal manure on vegetable substances is not pursued, it is believed, in our southern country. With us the universal method is, where a sufficient amount of vegetable matter has been brought together, to inclose the stock at nights on the heap, until it has been reduced to a proper consistency; through the process of fermentation. This brings the Committee to the consideration of the manner of making composts, and the materials of which they should consist.

COMPOSTS.

On this subject four important considerations present themselves.—1. The selection of a suitable site. 2. The use of retentive absorbents. 3. The collecting and adding together such materials as contain the greatest quantity of nutriment. 4. The preventing of waste. The site should be level ground, in the immediate vicinity of a bed of clay. Around it let an embankment be thrown up, with the ditch facing outwards.

In our sandy lands decomposition is rapid. Whilst the volatile portions of vegetable substances are perpetually escaping in the form of vapour, the earthy parts sink and are lost in the soil. By this means we ignorantly yield, perhaps, one-third of the treasure, which our unwearied efforts had been instrumental in gathering. To avoid this long practised error, the use of retentive absorbents, such as common clay and pine trash, are strongly recommended.

The following plan of increasing the quantity and improving the quality of manures, the sole object of composts, is considered judicious and proper:

1. Six or eight inches of common clay with as many bushels of foul salt intermixed.

2. A layer of pine trash with salt.

3. Animal dung. Keeping stocks on the mass for four or five weeks will subserve the purpose aimed at.

4. Vegetable and other matter, such as fennel and weeds on the edges of ditches and fences, thistles, oat-straw, corn-cobs, ashes,* soot,† corn-stalks, broom-grass, scrapings of yards, where there is no joint or nut-grass, pond-mud, and, in general, all the filth and rubbish of a plantation.

5. A few bushels of salt.

Upon these varient materials, let the cattle be nightly penned, until decomposition is carried sufficiently far—then cover the whole with clay. Whilst the clay and pine trash at the bottom, each aided by the influence of salt, will imbibe and hold the salts of the urine and other substances, which are usually lost, the surface clay will arrest and retain the gaseous effluvia, constituting as they do one half, and perhaps the more beneficial one of the entire bulk. By this mode too, dead matter is converted into mould. The surface clay will not only be impregnated with the enriching properties of the evaporating particles of the mass, but, if exposed a sufficient length of time, will be rendered still more valuable by the fertilizing action of the atmosphere itself. In proof of this, setting aside theoretical principles and the usage on our northern farms, where the subject of composts is well understood, it is with us a matter of annual notice, that clay from the bottom of ditches, several feet below the soil, if thrown on the surface, will, the first season, produce a better crop than the contiguous sandy parts. That some of the beneficial effects thus witnessed are ascribable to mechanical agency, is doubtless true. Hence, in this respect, common clay, which is nearly free from silicious earth, is far more efficacious in its operation than marsh-mud, which has only a small portion of alumina. Our composts contain in general only two ingredients—animal dung and pine-trash; sometimes rushes or marsh is added, and occasionally mud. The reason assigned is, that the supply of pine-trash is abundant. There are nevertheless solid objections to the too liberal ure of this substance. In the first place, it is the nursery bed of insects, which are so tenacious of life, that to destroy them the putrefactive process must be carried to a point beyond what prudence would advise. Again, pine-trash possesses a large proportion of inert matter, which is scarcely soluble. It is, perphaps, for this reason, that it is decidedly inferior to marsh, rushes, corn-stalks, &c. Exclusive of these important suggestions, it is well ascertained, that the value of composts depends on the variety of their materials, or a proper admixture of animal manure with vegetables, containing the largest amount of geine. This is proof of a very decided character that, as a general rule, for there are exceptions, a compound is better than any one of the elements that compose it.

Of all the substances profitable as manure, perhaps corn-stalks occupy the front rank. To scientific researches are we indebted for the knowledge of this useful truth. 1000 parts, says Davy, gave 84 parts of ashes; and 1000 parts of those ashes afforded 72.56 of soluble matter. It is known that, after the shocks and outer covering have been eaten by the cattle, the stalks are allowed to rot and give their virtue to the air.

* A bushel of ashes, says Dr. Dana, is equal to a cask of lime.

† In 100 parts of soot there are, beside other ingredients of value,
30.70 of Geine.
5.00 of Sulphate of Lime.
1.50 of Phosphate of Lime and Iron.
3.85 of Carbon.—*Dr. Dana.*

Using this plant, therefore, as manure, by burying it in the fall, or throwing it into the compost heap, is not robbing the soil on which it grew, unless the roots are taken, which of course should never be done. Here then is a source from which an abundant supply of the best aliment may be drawn.

Among the ends to be answered by the position of the larger part of the salt, the annihilation of the vermin with which, as already remarked, pine-trash abounds, is one of the most important.

It is not advised, though pounded shells thrown upon the pine-trash would have a happy tendency, that lime be added to the compost heap; because all the advantages to be realized from such a measure, are attainable by spreading the calcareous earth on the land, where it is most needed.

The mixed compost, thus briefly considered, recommends itself for its economy, variety of ingredients and facility of construction; for being composed of highly nutritious as well as stimulating and mechanical matter—and, as affording in relation to one of its conspicuous component parts, the means of profit, from which the cotton plant could before derive no assistance.

LIME.

As preliminary to their comments on this head, the Committee would invite the attention of the Society to Edmund Ruffin's interesting and instructive essay on calcareous manures. No treatise on any agricultural substances, emanating from the American press, has effected such valuable results, not only in this country but in Europe. In regard to Virginia, it has literally converted an abandoned soil into fruitful and luxuriant fields.

Lime is never found naturally in a pure state. It occupies a middle region between sand and clay. It benefits the former by rendering it more firm and adhesive, and the latter by making it less so. Deprived of its water and carbonic acid by fire,* it is called quick lime. Combined with carbonic acid in common lime stone, the shells of marine animals, &c., it is known as mild lime, or the carbonate of lime. With a friable mixture of clay, it receives the appellation of marl.† The sulphate of lime (gypsum or plaster of Paris) is composed of sulphur and oxygen and the phosphate‡ of lime, is the basis of bone manure. Whilst lime (caustic or quick lime) is a powerful promoter of putrefaction, its carbonate (mild lime) retards that process. The former is only used where there is an excess of organic matter. It re-combines so quickly

* The heat that is evolved in the process of slacking lime, is the caloric of the water, (for which it possesses so strong an affinity, that it will absorb one fourth of its weight of that fluid, and yet remain perfectly dry,) as it passes to its solid state, and does not proceed from the lime as is sometimes supposed.—*Parkes.*

† "Pure marl, when dry, is almost as white as chalk, and much lighter than common soil. When wet, it is of a light grey colour, especially if it contain much organic matter. When wet, it is plastic and adhesive; when dry, it falls into a fine powder. Found almost exclusively in swampy ground, generally in quite wet swamps, and is always covered by a stratum, often several feet thick, of black vegetable matter approaching to peat. It resembles white clay and sand. To find it make use of a pole—some will adhere."—*H. Colman, Commissioner for the Agricultural Survey of Massachusetts.*

‡ Cotton gives 1 per cent ashes, of which 17 per cent. is composed of phosphate of lime and magnesia.—*Dr. Dana.*

with carbonic acid, if exposed to the atmosphere, that, where its solvent powers are needed, it should be applied as soon after it is slacked as possible. Mild lime, in the form of ground or powdered shells, by preventing the too rapid decomposition of vegetable substances, performs a highly useful function. For this reason, no sudden increase of fertility is to be expected from calcareous manures. When it is considered that, in our hot climate, the putrefactive process is readily brought about, and that our lands, from their light and porous nature, are too favourable to the escape of the volatile parts given out by fermentation, any substance that, whilst it attracts moisture, will yield food only to the growing plant; that will combine with and fix manures in the soil; (sand has no power in holding vegetable and animal manures,) that will impregnate the earth with aliment drawn from the atmosphere; that will hasten the ripening of the crop, and that will neutralize acids, possesses properties of rare value to the planter. Such a substance is mild lime.

All soils destitute of calcareous matter have acid properties; and, on the high authority of Mr. Ruffin, such soils possess the power of reducing to powder the comminuted shells, which by the plough or otherwise may be mixed with them. The quantity of mild lime used to the acre is from fifty to three hundred bushels—to be renewed in ten or fifteen years. The best shells, whether oyster, clam, or muscle, are those from which the living principle has recently been taken. Such are infinitely to be preferred to the calcareons beds, which on the edges of our rivers have been bleaching perhaps for a century. The first contains mud and animal matter, and is otherwise richer in its saline ingredients. If no other efforts be made by the planter in this business, than to burn and use as a manure the oyster shells which the industry of his negroes may have thrown about their dwellings, he will confer on them, as far as their health is concerned, and on his lands, especially where broom-grass is wont to grow, a benefit of incalculable magnitude.

Mr. Ruffin, as a prudent admonition to those who may be disposed to try the virtues of calcareous manures, says, "its benefits must necessarily be gradual, never quickly perceptible, nor can it be expected at all, unless on soils under meliorating culture, which will allow more to return to the earth than is taken off." In confirmation of this opinion, he gives the result of twelve years trial of liming very poor land sown in wheat. The first three years, the average product was five bushels and one-third; the next three—eight bushels, and the last three, ten bushels and a half; thus doubling his crop mainly (the land rested two years in four, and was not grazed,) from a single though heavy dressing of mild lime.

The Committee cannot conclude their report without submitting a few reflections suggested by Professor Shepard's communication. To chemical science alone are we indebted for the information it imparts. From no other source could light have been shed upon a matter so replete with interest to the owner of sea-island lands. "Agricultural chemistry," said Sir Humphrey Davy, "has for its objects all those changes in the arrangements of matter connected with the growth and nourishment of plants; the comparative values of their produce as food; the constitution of soils; the manner in which lands are enriched by manure or rendered fertile by the different processes of cultivation. Inquiries of such a nature cannot but be interesting and important, both to the theoretical agriculturist and to the practical farmer. To the first, they are neces-

sary in supplying most of the fundamental principles on which the theory of the art depends. To the second, they are useful in affording simple and easy experiments for directing his labours, and for enabling him to pursue a certain and systematic plan of improvement." "Man," he elsewhere beautifully remarks, "must consider the vegetable kingdom, not as a secure and unalterable inheritance, spontaneously providing for his wants, but as a doubtful and insecure possession, to be preserved only by labour and extended and perfected by ingenuity." An acquaintance with the fundamental laws which regulate the operations of husbandry are as necessary to the Agriculturist, as a scientific knowledge of the human system and of materia medica is to the followers of the healing art. The empiric who indiscriminately prescribes one or two favourite nostrums, merits the contempt of every man who values human life. Yet, the husbandman, who enters the temple of science, the better to qualify him for the proper discharge of his multifarious and complicated duties, is viewed as a mid-day dreamer, who seeks for that, which, if acquired, would only unfit him for his pursuit, by diverting his attention to objects of uncertain and subordinate interest. Although we are justly told by one of the profoundest philosophers* of any age, that when theoretical knowledge and practical skill are happily combined in the same person, the intellectual power of man appears in its full perfection, and fits him equally to conduct with a masterly hand the details of ordinary business, and to contend successfully with the untried difficulties of new and perplexing situations—still, it is deeply humiliating to declare, that in the sober judgment of perhaps every agricultural community, theory and practice are antagonistic;—they cannot successfully be united in the same individual. If the vegetable world possesses a living principle—if every species has a regular organization, which requires for its support an incessant supply of food—if each plant has its period of growth, health, disease, decay, and death, is it not certain, that the laws which govern vegetables are fixed and immutable? If so, is an acquaintance with those laws unimportant, especially to him whose province it is to aid nature in replenishing the earth with food? What information can mere observation impart to the farmer concerning the composition of his soils and manures? He knows that a particular plant will not thrive upon a certain soil. But why? No answer is heard. He scouts the belief, that the man of science, whose book, it may be, is his sole guide, and who perhaps has never been beyond the purlieus of his city abode, can instruct him in his vocation, and by so doing greatly promote his temporal welfare. Yet the fact is indisputable. A portion of the farm of Sir Joseph Banks was sterile. All his exertions to raise one of the numerous crops usually cultivated, failed. A specimen of the soil was put into the hands of a chemist of London, who readily detected the sulphhate of iron. The remedy, carbonate of lime, was applied—and the enemy that had so long baffled the well directed efforts of this distinguished nobleman and agriculturist, ceased longer to assail him.

All which is respectfully submitted by

WHITEMARSH B. SEABROOK,
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G. W. WESTCOAT,
} *Committee.*

Edisto Island, July 13th, 1840.

* Stewart.

For the Southern Cabinet.

FORMATION AND MODIFICATION OF SOILS.

Abbeville District, 1840.

Mr. Editor,—It is vastly more easy to destroy than to restore. Of this we have melancholy proof not only in this district, but in the state of South-Carolina, and indeed the whole southern country. Many consider this portion of the State as already worn out, although not more than a generation has passed away, since the axe of the first settlers resounded through its forests. At that period it was described as a region of the greatest fertility, and yet, though it is scarcely cleared, (remnants of the virgin forests still remaining,) we hear of its almost complete impoverishment, and find that a majority of its most active inhabitants are deserting it, for the newer regions, which are daily opening, before the restless, and money-loving spirit of our countrymen. These pioneers leave comforts, and friends, and a country of peace, order, law, and the conveniences of population, for untried localities, where numbers perish from the unhealthiness of the climate, whilst others drag out a miserable existence, and perhaps find, when too late to retrieve their errors, that their pockets are not heavier, while health is gone. I would fain give this restless spirit, this emigrating mania, the nobler name of enterprise, but I fear that many are actuated by the same incentive, with the profligate, who has consumed his rich inheritance, and takes to the dice.

This district, like many other portions of our country, was styled inexhaustible—a word which should be banished from the agricultural dictionary. Ignorance, and cupidity, first set the example of improvident cultivation, and the same implements, and modes, still continue to be used, and if persevered in, will not fail to accomplish the total ruin of the country, which is blest with many resources, and among others, a climate for which nothing can compensate. This mania of tearing up and laying waste the land, and then abandoning it, has been so long pursued, that I am almost induced to believe, (if such a thing were possible,) that these Tartar-like habits have become hereditary, and are increasing with each generation. But there are indications of that population being replaced by one, whose task is of a higher order, and requiring a higher grade of intellect, whose endeavours should be to re-construct, and aid nature, by art, in forming a basis, upon which population and society may advance with security.

It is impossible for one to know the actuating causes with all who emigrate, but having seen some instances of disappointment not dissimilar from those I have hinted at, I hope that these remarks may fall under the eye of some one, who may be led to ponder a moment longer than he would have done, ere he decides, and when he does may health and prosperity attend him, and permit me to say to him, that whatever be his determination, he will find a strict attention to his own business the surest means of success. Dependence upon agents is a frequent reason of failure and disappointment, and has been a prominent cause of the impoverishment of the country. When he has selected his new settlement, which will most probably be upon a virgin soil, he will be in precisely a similar position with the first settlers in the abandoned regions. It is to be hoped that the example of what has passed there, may be a warning, and make him strenuous in his future exertions, at

least to maintain, if not to add to the fertility of the soil, which should be considered as a natural loan, which man is in duty bound to hand down to future generations as little impaired as possible. Such will be the result, if he exerts his capacity, and considers his individual interest, and the duty he owes to his country.

Upon this subject much has been said, and I do not expect or attempt to present any new views, but if I can awaken a desire in one more to inquire into the means of maintaining that wealth, which has been accumulating for so many ages, or to renovate that which has been deteriorated by improvident cultivation, or finally to endeavour to perfect nature where it is thought she has been remiss, my object will have been attained.

It appears to me that the first duty of the agriculturist should be to make himself intimately and entirely acquainted with the nature of the soil with which he intends to operate. Without that information, his efforts will avail no more than those of the mariner who would arrive at his destined port without calling to his aid the science of navigation. To aid in effecting this end occasional references to the sciences will be necessary.

All soils are formed from the detritus of rocks mixed with finely cominuted organic matter, and as the constituents differ and vary in their proportions, the one with regard to the other, so is the soil good or bad, or adapted to the growth of different vegetation. From a given rock it is easy to predict the prominent features of the compound, which is formed from its disintegration and decomposition for all distinct mineral species of which rocks are formed, being composed in atomic proportions, of the same simple substances producing certain results, when submitted to action under similar circumstances, it follows that the physical inspection of a rock will suffice to give a general, though by no means a perfect idea, of the composition of a soil which is derived from it. To arrive at just conclusions, from such data, it would, of course, be improper to conclude that all soils are the result of the disintegration and decomposition of the under-lying rock. Though such is frequently the case, it will, nevertheless, be necessary to consider the physical geography of the country around, and the relative position of one portion to another, and we should never lose sight of that general, and constantly acting law, of the tendency of highlands to depression, and the consequent elevation of depressions.

In some cases, from the nature of the under-lying strata, the rock and soil are precisely similar. Such is the case with the Downs, over which you pass in going from London to Exeter, in which the substratum is chalk, and the soil almost entirely composed of carbonate of lime. The carbonate of lime being only susceptible, under the ordinary influences of disintegration and not decomposition. Again the soil may be actually wanting in the constituents of the rock, as we see is sometimes the case in the blue lime stone valley of Virginia, which continues on through Maryland, into Pennsylvania; for although there is no chemical difference in the composition of chalk and blue lime-stone, their physical properties differ materially. The former is friable, and forms a paste with water, while the latter is tenacious, hard, and requires abrasion to disintegrate. The former is, probably, analogous in one respect, to the best lands of Alabama, for instance those of Marengo county, where the *rotten lime-stone* disintegrates and falls into powder when exposed to

atmospheric agents, but their character is widely different, as the Downs are composed entirely of carbonate of lime, and are consequently arid, while the lands of Marengo leave a favourable admixture for fertility. It may, or may not, be necessary here to make a remark, which will be found in all the works upon agricultural chemistry, that the best soils are formed of several constituents in certain proportions.

From what has been said it will be seen, that a total reliance upon apparent rocks may lead to error, as amongst other reasons, the soil may take its character from depositions, the source of which is at some distance. For instance, the sulphate of lime (or gypsum) is found massive and chrystallised, about the mouth of the Shannondale springs in Jefferson county, (Va.) although that rock has not been remarked in situ, in or about the environs of that watering place. We do not say it may not be found, but such has not yet been the case. Again, in the same county, along a branch near Charleston, a considerable deposit containing much carbonate of lime, with minute shells, covers the clay, which immediately over-lies the lime-stone rock. Deposits of indurated carbonate of lime sometimes cover earth which may or may not be calcareous, as is the case near some of the mineral springs in Greenbriar county in the same State. These calcareous depositions are the result of the decomposition of the bi-carbonate of lime, which the water holds in solution, when it issues from the ground. By exposure to the air one half of the carbonic acid escapes, and the simple carbonate of lime is the result, which being insoluble is precipitated. Thus are formed stalagmites, and stalactites, and those incrustations which coat the interior of culinary vessels in lime-stone regions. This is not only the case with lime, but the salts of iron, soda, magnesia, &c. are found impregnating water and affecting the soils with which they come in contact, sometimes disadvantageously and at others beneficially.

There are instances of sterility not immediately caused by the constituents of the soil, but by the influence of proximate mineral substances, in which chemical action is constantly progressing, giving rise to gaseous emanations, and otber products, deleterious to vegetation. This is remarked in those countries where there are deposits of mineral substances. It is not uncommon to see vegetable remains entirely *feruginized*, (if I may be allowed to use this term, for the replacing organic matter by the oxide of iron,) when a deposit of sulphuret of iron is found beneath the surface. Such is the case at the copperas (sulphate of iron) works near Norwich (Vermont,) where there are specimens of plants entirely transformed into oxide of iron, arising from the decomposition of the sulphuret beneath the soil.

The composition of the sub-stratum has sometimes, though but a negative, not a less important influence, upon fertility. In illustration of this, I will mention a fact that has come to my knowledge within a few days. A friend brought me, for examination, a substance which forms a deposit in some of the vallies, in the mountainous regions of North-Carolina. This specimen is deep brown, almost black, friable, and tasteless. When cut by a knife the sides of the incision had a waxy lustre. By incineration it leaves a quantity of grey ashes. It is apparently (for I had no means of examining it accurately) a substance similar to those which I analysed some time ago, an account of which will be found in a back number of the journal of the Franklin Institute of Philadelphia, and is of the nature of alumina, of which I spoke in an

article which you did me the honour to publish in your last May No. It is the residuum of decomposed organic matter, and if added alone to the soil as a fertilizer it would be inefficacious (at least it would have no specific action on vegetation, though it might mellow the soil,) from the fact of its indestructible nature, by the ordinary atmospheric agents. It is covered by a turf of meagre harsh grass, and reposes upon a bed of gravel, which is here the cause of sterility, and which precludes the possibility of permanent improvement by any means of which I am aware. If by the addition of lime, or from any other cause, a decomposition should be effected, water would not fail to dissolve the soluble compounds resulting therefrom, and owing to the porosity of the substance and sub-stratum, not only the soluble parts would be filtered, and thus carried off, but along with them the finer particles of inorganic matter that would be held in suspension.

This chapter might have been extended to almost any length, with illustrations showing the forming, and modifications, of soils; but having given a sufficiency to direct how the investigation should be pursued, I shall for the moment rest content.

By thus considering the various causes and effects of chemical action, conclusions, within definite limits, may be arrived at, and the necessary and final chemical examination made easy, without which all deductions will be inconclusive and liable to error.

It was my intention, at this time, to have said something upon the modes, &c. of docimasie, but as this is a science in every respect difficult, requiring much minute chemical information, much practice, and finally much aptitude at manipulation, besides some apparatus which is not easily procured in the U. States—it is, therefore, better that such information should be solicited from some one who has devoted his time and attention to these subjects.

Having obtained a correct analysis of the soil, it will not be difficult to decide on the remedies which are required to make it what we would have it. If this subject was a little more attended to, we should be able to ascertain what writers mean when they speak of their soil, which it is not always easy to discover, from the terms generally used to designate their composition, these terms being, at present, mostly names for things which they do not themselves understand.

The remedies will next be the objects of research, and will require a knowledge of the mineral wealth of the circumjacent country, and frequently of the resources of comparatively distant regions.

If agriculturists would but give a few leisure hours to the acquisition of this kind of knowledge, the amount of benefit that would accrue to individuals and the community would be immense, and far surpassing the results procured from State geological surveys, which though not without interest, have been of less service than was expected. This arises partly from the manner in which they have been executed, and partly from the impossibility of one or more individuals giving that minute examination which would be necessary to benefit each particular case.

I have mentioned above, that this country, though new, was considered "worn out," and this, in truth, is the case, if the destruction of the organic matter in the soil, and the washing away of the tillable earth constitutes wearing out. It is not astonishing then that the result of this state of things should be emigration, for it is almost madness to remain and continue the same old modes of culture which have already almost

ruined the country. Without a change, (which must be for the better, for it can scarce be for the worse,) the time must inevitably come when there will not be a bale of cotton grown, save on those spots which are casually enriched by inundation. The last remnants of agricultural resource will be extracted to sustain the negro population, whose increase may continue a little longer to be a source of profit, but even this in time must cease, or be removed to newer countries, which are undergoing the same deteriorating system. The truths are startling and unpleasant, but it is our duty to dwell on them, and awaken attention to the subject ere it is too late to arrest the downward progress. The renovation of the soil must now be the main object, for it is the only sure basis of prosperity. Fences must be renewed, and the dilapidated tenements replaced by more permanent habitations, for so long as people continue to throw together a few boards as a shelter till the land is exhausted, so long will there be a want of an earnest intention to improve. Let the feeling be created, that this is to be our permanent home, and one which we wish to transmit to our children, and improvement, and comfort, will from that moment be progressive.

It is idle to talk of direct trade, of commercial conventions, and internal improvements, when population is already spare, and its numbers daily decreasing, and in the same ratio the consuming capacity of the country. It is vain to talk of staples when the soil refuses to grow them, and when the last remnants of fertility are exhausted, to procure labouring animals and food from elsewhere A man is only wealthy in proportion to the productiveness of his capital. A small place well improved, is better than thousands of acres of waste, or badly cultivated, land, and the time is fast approaching when the country will not have the resources of speculations on remote contingencies, or an inflated currency to give fictitious wealth. Production is the only sure basis of advancement, and to ensure this our land must be renovated and maintained, or the wealth and glory of Carolina is departed.

I have thrown these few hints, Mr. Editor, as texts for further remarks, or as a means of drawing attention to a subject so important to us, and the whole South, rather than as an essay complete in itself; and should time and circumstance permit, I may at some future period, carry out some of the ideas of this article, or proceed to the investigation of the important subject upon which I have not yet touched—the means to be employed for renovation. C.

For the Southern Cabinet.

DWARF FRUIT TREES.—SUMMER GRAFTING.

Trees of this shape, though so generally in use in Europe and so valuable in small city gardens, are hardly known even by name in many parts of our country. They are remarkable for the little room they occupy, and for the great quantity and beauty of the fruit they bear, while they do not interfere with the cultivation of culinary vegetables,

and are much less particular about the nature of the soil in which they are planted than standard trees. Two English writers quoted, in an article on Orchards, at page 101 of the sixth volume of the So. Agriculturist, state three and a half and four bushels of apples as the products of single trees six feet apart. The following extract from an editorial note in the *Manuel du Jardinier* may account for the increased size and quantity of the fruit of dwarf trees.—"It is a well known axiom of natural history, and which applies not only to vegetables, but also to organic beings, that the more any being is altered in its constitution, the more the vital force that remains in it is concentrated upon the organs of reproduction (regeneration) in order that the existence of the species may not be compromised by the loss of the individual. Now grafting only increases the number of fruit and hastens the movement where a tree ought to furnish it because it alters its nature. In placing graft upon graft the alteration is increased, whence results a manifest disorder in the vital forces, which abandon the limits and branches in order to concentrate themselves upon the fruit of which they increase the pericarp, and in consequence of this very disorder very often at the expense of the soils. In short, the more a tree is grafted (we mean graft upon graft) the more its stems, limbs and branches are stunted. All fruit trees may be dwarfed successfully—even the peach, provided it is budded upon the plum, and renewed every year by skillful pruning upon the new wood, yet the apple most readily adapts itself to this shape when grafted upon the Dutch paradise stock. I have one of these only about one foot and a half high, yet had five blossoms this spring. The process of dwarfing trees seems to be so generally known in Europe that it appears to be thought unnecessary to give any description of it in any of their works on gardening that I have seen. In some cases it appears to depend entirely upon the stock as in the apple upon the Paradise, and in others partly upon the stock and partly upon the training or pruning as in the pear upon the quince and stone fruits upon the plum.

The varieties of pears best adapted to this shape are the grey or Autumn Doyenné, the white butter or St. Michael, Bezy d'Echasseni, St. Germand, and some few others. To obtain a handsome bushy dwarf, bud or graft at or near the surface of the ground, head down to five or six inches, and on the shooting of the buds reserve three to five of the strongest shoots to form the principal branches. The tree may then in a manner be abandoned to nature, always however taking care to suppress the too luxuriant shoots and to preserve equilibrium between the wood and fruit branches. Budding is generally believed in Europe to furnish more durable trees than grafting, but Messrs. Noisette and Boitard confess that this is not satisfactorily proved. I should think that our common white haw, might prove a good substitute for the Paradise, which is only a very small growing variety of the apple-tree, though I have never made the trial, nor heard of its having been made, but will endeavour to do so this summer.

SUMMER GRAFTING.

As the following variety of grafting, slightly varied from Loudon, in addition to the other advantages of grafting, adds those of being successfully performed during almost the whole summer and on very small stocks, a description of it may prove acceptable to some of your readers, particularly those who are just beginning the cultivation of fruit trees.

It is never attempted until the bark separates freely from the wood of the stock. The head of the stock is to be cut off obliquely by a single stroke of the knife, and the scion is to be split upwards a sufficient length by entering the knife in the middle of the medulla at its lower end. The two divisions are then to be tapered from the inside to a thin edge at their ends, the shorter division is to be introduced, as in crown-grafting, between the bark and the wood of the upper side of the stock, and the other or longer division is to be passed up over the head of the stock and introduced in the same way in the lower side, if the stock is sufficiently large to admit of its being done without separating the bark all round; if it cannot be done, it is to be fitted on by paring off a piece of the bark and wood of the stock as in scallope budding. It is then to be carefully bandaged to keep the scion in place and keep out rain and sun. I have never used any clay or composition, and have bandaged with soaked bass, or silk grass, or even cotton yarn, and yet in twenty or thirty grafts have not lost one that I can remember. It is principally applicable to apples and pears, as stone fruits ought always to be budded.

R. C.

HARVESTING OF CORN.

As the season is approaching in which the farmers will commence the securing the abundant crop of corn with which a bountiful Providence has blessed our country, it may be pertinent to the occasion to offer a few remarks upon the best mode of harvesting the crop.

Our Virginia ancestors, and those who think it wise to plant and cultivate and gather as our fathers have done, pursue the old method; about this time they gathered the blades below the ears of corn—after they consider the corn to be ripe, they top the stalk and secure all of the fodder in stacks for winter use. In November they pull the corn and remove it to cribs, where it is husked out at leisure. This mode is rapidly yielding in the stock districts to that first introduced among the graziers on the south branch of the Potomac. The farmers in the northern and middle districts of Kentucky, and in the Scioto valley of Ohio, have generally adopted this latter mode; which is to cut the stalks, corn, fodder and all, and place them in shocks commonly embracing sixteen hills square.

I have seen the richest crops of many climates gathered, and there is no operation in husbandry so animating as that of cutting corn in the mode just mentioned. It is a most cheering prospect to see twenty acres of corn pass in one or two days to a condition in which it is prepared to keep in the field throughout the winter. This remark is predicated particularly upon the plan of riddling the squares instead of cutting the whole square at once. It will readily occur to any observing mind, that as corn does not ripen with precise regularity, if the entire square is cut at once, some of the corn will mould and sometimes even the fodder will be affected, if the cutting shall be followed by warm or wet

weather. To avoid this contingency some graziers commence with the process of riddling, that is, they select only such part of the sixteen hills square as may be ripe—go through the field in this way and in ten days complete the cutting of the square. By this process several important advantages are obtained—the greatest amount of fodder is secured, consistently with the paramouut object of saving the corn, and a nucleus for the shock being formed by the first cutting in the square, the shock becomes settled and stands better during the winter. In the rich counties of Clarke and Bourbon, they sometimes cut half of the square on one side and then in ten days finish it. Whilst many graziers in Fayette, Lincoln and Shelby, prefer the process of riddling.

In the course of October and November, thesc shocks are shucked out, the corn placed in cribs and two of the shocks placed together, or one placed upon the ground and two others put around it.

It is the opinion of practical farmers, that the practice of cutting corn in this mode secures the greatest amount of corn and fodder with the least expense, and is decidedly an improvement on the old Virginia plan, more especially when applied to the feeding of cattle or mules. T.

[*Franklin Farmer.*

OUR MODE OF MAKING HAY.

WE have seen various methods tried, but we have never found any that are better than the following:—Mow the grass in the forenoon or towards evening—let it be well spread to the sun—rake it together in the afternoon and put it in cocks if the weather is not promising—or when the harvest is great and the hay is not dry enough to be raked, it should be turned green side up before the dew has copiously fallen—on the next day this should all be spread out to the sun, and two days of good weather will generally fit the hay for the barn. When the burthen is quite heavy, or when the grass is very green we give it more than two days sunning—but frequent stirring makes a vast difference in the time necessary to cure hay—the oftener it is moved the sooner it will become dry.

An experienced hand will judge intuitively, almost, when his hay is fit for the scaffold—some wring a handful to see if any moisture is left in it—but as a general rule English hay must have two days sunning unless we cut it so late that it has become half-dry while standing. If we suspect our hay is not quite dry enough but do not wish to risk it out longer, we may often save it by throwing it on a scaffold or a bay and not suffer it to be trodden down for a few days—and one peck of salt on a ton often saves us the labor of another day's opening and tending.

If we have but little hay and wish it cured in the nicest manner we are careful to put it in cocks while warm and before the dew falls—on the next day we find it has been drying since we packed it up, and, on opening, it presents a fine appearance—but when we have large quantities on hand we cannot always be so particular—we suffer it to lie in winrow when the weather is good, and thus save the labor of packing and of opening again.

[*Boston Cultivator.*

HAY MAKING.

If the weather be unfavorable, and you find it difficult thoroughly to cure your hay, it is recommended to apply from one to two gallons of salt to each ton of hay. With this application it may be saved in a much greener state, and "the benefit derived from the salt," says Fessenden, "is many times its value."

Another Method.—In saving green or wet hay, some farmers mix layers of dry straw in the mow or stack. They thus save the escaping strength of the grass, it being absorbed in the straw, and cattle are quite fond of the mixture.

For the Southern Cabinet.

A PROPOSITION TO RICE PLANTERS.

BY R. F. W. A.

Georgetown, June 29th, 1840.

Mr. Editor,—In these times of general depression; when, it requires a large quantity of produce to realize a small sum of money—when those who are in debt find it impracticable to "raise the wind" in order to breathe the elastic air of the mountains, or indulge in the wholesome luxury of sea-bathing, and when even those who are free from debt find it prudent to stay at home, it is reasonable to presume that a greater number of rice-planters than is usual are giving their personal attention to the management of their plantations. Your readers may place me with either of the classes indicated above as may suit their several imaginings. I am at home doing the best in my power with my paternal acres to relieve myself from the probable effect of a series of low prices next year again. I am desirous, if there is known to any of your readers a better system of culture than that which is in practice here, to be possessed of it. With this view, therefore, (not in the spirit of boast, for I have nothing to boast of, even if it were my disposition, which it is not,) I invite rice-planters, generally, to an honest and generous competition, as I conceive this to be the only method of obtaining the benefit of their various experience in detail. There is *in operation* in the district where I reside no Agricultural Society—with regret I say it. But our systems of planting (for there are two) are pretty well understood amongst ourselves. I have always believed that planters would improve their method of planting rice in proportion as they intercharged ideas on the subject, and observed the practices of each other. I am every year more and more interested in my profession, yet it occurs to me not unfrequently that I have not made due progress in it. This too is likely to prove an extraordinary season. We have been visited by a succession of very high tides, and a heavy freshet upon their heels—some rice has been much injured by the latter, others seem to have been improved by it.

I ask leave respectfully to propose that planters from every section of the rice region do compare notes next winter in Charleston: and, by

means of their journal of this year's management and remarks thereon, communicate to each other their respective views and improvements. To render the meeting more interesting, as well as to defray its expenses, (for I trust we shall not separate without dining together at the Carolina Hotel,) and I presume neither Georgia nor North-Carolina will object to this. I propose that each planter who represents a system of his own (whether original or not, does not matter,) shall exhibit at your office, or any more convenient place which you may provide, *fifty bushels of rough rice* to be taken from, and be a fair sample of the product of a field containing not less than five acres (of two hundred and two feet square to the acre,) the field to be harvested and thrashed, and the sample put up in presence of the nearest magistrate who shall give his certificate as to the quantity per acre. Each planter so exhibiting, to choose one or more experienced persons as judges who together shall choose an umpire and divide into committees for determining each separately.—

1. The quantity in bushels per acre to be estimated in fractions of a unit.
2. Its quantity as seed rice.
3. Its freedom from red rice to be estimated in fractions of units.
4. Its freedom from grass seed to be estimated in fractions of units.
5. Its weight per bushel to be estimated in fractions of units.

The owner of the best sample as seed-rice, to be awarded the whole, together with the honor of the expences of the table. Will you, Mr. Editor, take upon yourself the trouble of arranging the details of this meeting, provided you agree with me, that such a one will be productive of good to the planting community? Each planter intending to join in these stakes, to signify such his intention to you, on or before the 1st October next. I suggest the Tuesday after the Charleston Races as the time of exhibition, but will agree to any other subsequent time that may be more generally convenient. R. F. W. A.

The above is from one of our best rice planters, and we invite the co-operation of the rice planters, not only of this, but of the adjoining States. We regret that our absence from the city the whole of the last month, prevented an earlier insertion of the article, for the object is one of importance, and deserving of attention. We need scarcely say, that we cheerfully comply with the wishes of our correspondent, and will forward the project by all means in our power. We will at the proper time receive and exhibit at our Agricultural Repository, all samples which may be sent for exhibition. We invite our planters to enter the list and compete for the honor and the prize. High honor will it be to him who may win it. Could not similar exhibitions be got up for our Sea-Island and upland cottons?

Any aid in our power to promote such exhibitions, will be most cheerfully renderd. [ED. SO. CABINET.

For the Southern Cabinet.

SPONTANEOUS FORMATION OF SULPHATE OF LIME—ACTION OF MINERAL SALTS ON VEGETABLES. BY W. L.

Without any *polemic* design, I venture to make the following observations, trusting that I shall receive indulgence, should this notice, which I propose to make brief, be extended involuntarily beyond its proper limits.

The esteemed author of the valuable article "*on the ambiguity of terms*," in a late number of the Southern Cabinet, ingeniously suggests that sulphate of lime may be produced by the action taking place between the native sulphuret of iron and lime-stone, when exposed to the influence of the atmosphere. Were it not that reference must be had to other circumstances unavoidably connected with the processes, this certainly would be the most expedient method, requiring neither accuracy nor care, which of course could not be bestowed by the simple inexperienced labourer.

While the spontaneous decomposition of the native sulphuret of iron cannot be doubted, it should be borne in mind, that all its varieties do not posses this property, and that those in which it does exist, do not undergo the change with equal facility. It is true, as the author remarks, that by exposure of the sulphuret of iron to the influence of the atmosphere, oxidation takes place, and sulphuric acid is formed, with oxide of iron, both of which unite to form sulphate of iron. Now this salt can exist in contact with limestone, without being decomposed by it. By longer exposure to the atmosphere, however, it would become partly acid, and then be disposed to form a small quantity of sulphate of lime, but altogether too inconsiderable in amount to be of any utility in agriculture.

If instead of lime-stone (carbonate of lime,) we take lime, the decomposition of the sulphate of iron would be perfect, and the product would be sulphate of lime in considerable quantity. But in this case, the inquiry would remain, whether the large quantity of oxide of iron existing in the compound, would not be an objection to its employment, it having been ascertained by the experience of centuries, that soils containing a large quantity of this oxide are not favorable for agriculture, and in some instances are totally barren.

Indeed, metallic salts generally are in a great degree noxious to vegetables. Thus, a solution of the sulphate of copper poured on the roots of a poplar tree, when in full und luxuriant growth, will cause its death in a short time.

Alkalies and earths when made accessible to vegetable action, produce effects very different from those resulting from the action of metallic salts. It is chiefly by the agency of these bodies, in combination with humic acid, that soils are made fertile—the alkalies and earths, when united with the acid, rendering the organic matter contained in the soil soluble, and thus susceptible of being taken up by plants. From this source is derived the salts discovered in vegetables by chemical analysis.

By some it has been affirmed that plants may be raised without the agency of organic matter, merely by sowing the seeds in flower of

sulphur, and watering with distilled water. Plants thus reared, it is said, contain the same salts, both in quantity and quality, as those grown under ordinary circumstances. Hence, it has been inferred, that the vital powers of plants are capable, unassisted, of forming out of the elements of the water, all the natural constituents of vegetables, and imparting to them all their essential characters.

Others have questioned the truth of this conclusion, affirming that under their own observation, plants thus treated, never attained perfection, and attributing the results said to have been obtained, either to some orror in the experiment, or to too great admiration of a phenomenon so interesting.

But while the opinion alluded to is doubted by some, and may be misrepresented, it would be improper to deny the possibility of the occurrence, since an analagous phenomenon in the animal kingdom gives a semblance of truth to the hypothesis. Thus, a chick just emerging from the egg, contains three or four times as much carbonate of lime, as can be detected in the egg before its contents escape.

But however this may be, until we can command repeated and exact experiments on the subject, although we may be permitted to admire it, on account of the immense field it opens for contemplation, we shall still be obliged to view it as a speculation not satisfactorily proved, and adopt the other opinion, which supposes the presence of soluble vegetable and mineral substances in soils, as indispensably necessary for the nourishment and growth of plants.

That the humic salts are decomposed by plants, cannot be doubted, since no such salts can be discovered in the living vegetable. How this is accomplished remains to be determined, unless we at once surmount all difficulties by ascribing it to their vital powers. The great affinity of humic acid for bases, is sufficiently well known. It is so strong, that it even decomposes silicates and aluminates. On this account it seizes with great readiness upon all vegetable and mineral manures, especially those of a calcareous nature. Lime, having the strongest affinity for humic acid, is readily converted into a humic salt, and as before suggested, this is almost the only form in which it is susceptible of being taken up by the organization of plants. So far as I know, gypsum is the only instance of a calcarious manure being absorbed by plants in the same state in which it exists in the soil. This salt is not only absorbed after decompostion in the ordinary way, but it is also taken up by the plant in its original chemical state. This, however, is confined chiefly to the family leguminos, to which belong the clovers, beans, peas, &c, in the ashes of which sulphate of lime is invariably found. Some experiments render it probable that nitre (salt-petre) may act in a similar manner.

The more soluble the salts formed from manures, the greater will be the benefits conferred by them upon the soil, and the more visible their fertilizing properties. From this source is derived, partially at least, the great fertility of animal dung, which abounds with salts of ammonia, potash, and soda—all capable of forming soluble compounds with humic acid, while they, at the same time, possess stimulating properties. Their effects would be much more permanent, were it not for the almost constant presence of carbonate of lime, which gives rise to the formation of salts of lime. Some of these soluble salts have long been employed in Holland—especially nitre, in the cultivation of hyacinths, and more recently, tne nitrate of soda has been highly recommended.

I beg leave to make a slight digression, in order to allude to an interesting fact not generally known, tending to throw some light on the effects of a rotation of crops. It has been often observed, that certain plants when made to succeed others of a different species, grow as vigorously as if they had been planted in a new field, while the growth of others is retarded, or entirely arrested, by certain species of weeds.

Brugman observed, that towards morning, the roots of certain plants secrete on their tops a peculiar liquid, which coming in contact with the roots of other plants, exercises so deleterious an influence upon them as to cause them to wither, and if often repeated, to occasion their death. In this manner are certainly killed—

Oats—*Avena sativa*, by *Serratula arvensis.*
Flax—*Linum usitatissimum*, by *Scabiosa arvensis.*
Euphorbia peplus.
Wheat—*Triticum*, by *Erigeron acre.*
Buckwheat—*Polygonum fagopyrum*, by *Spergula arvensis.*
Carrot—*Daucus carota*, by *Inula helenium.*

Three drops, quasi excrements of plants, may be considered as common to all, yet they are by no means equally destructive in their operation upon all other plants. Remaining in the soil after the removal of the yearly crops, like any other artificial addition to the soil, they exercise an influence upon the crops subsequently cultivated, either beneficial or deliterious. This certainly furnishes a strong argument in favor of rotation of crops. W. L.

MANAGEMENT OF PIGS.

Messrs. Gaylord & Tucker,—The management of fine breed pigs is eliciting more attention at this day throughout this country and England, than at any former period. All the essays I have noticed on the subject have passed very indefinately over what I conceive to be the most difficult period of the animal's existence, and one through which he seldom or never carries all his good points—which is that of leaving the sow.

The cause appears to me to be this: sows' milk is much more rich and nutritious than cows', consequently little action or concoction of the stomach previous to being carried into the circulation is required; for indeed swine being carnivorous by nature, possess at all times very weak digestive powers; the pig being taken from the sow or weaned by her, large quantities of cows' milk is almost invariably given as a substitute, perhaps three times per day. The large quantity nearly paralyzes the little digestive powers the pig previously possessed; consequently his belly becomes distended far beyond its wonted size, assuming a disgusting bladowy or bellows-like appearance; he grows poor, his shoulders contract, his rump becomes peaked, his back settles down back of his shoulder blades, and then rounds up something like a hedge-hog's, and to finish the picture, his hair is no longer brilliant and glossy, but dry,

crumbling and dead, and often turning the other way; not a vestige of that clean cylindrical form, which never fails to elicit admiration, where beauty has any attraction, remains, nor does he ever effectually recover. Blood and pedigree are no guards against this. I would hazard a few suggestions as a remedy, not that I conceive them to be unexceptionable, but that they may be the means of drawing forth some that are, from Messrs. Lossing, Bement or Allen, or any other talented gentlemen engaged in the cultivation of "the noble animal."

I would have the pig *well* accustomed to the *trough* before weaning, in a place shut off from the interference of his mother; I would feed him four or five times per day with boiled rice, and boiled potatoes mashed, alternately adding a little milk from a new milch cow, all to be given in very small quantities, with trough kept clean; small quantities of beeve's liver, have a fine effect in yielding nourishment profusely, is easy of digestion, without distending the belly unusually; sheep's plucks are good, but should be boiled.

No pig should be taken from its mother while she gives any milk at all; but in cases where it is unavoidable, it should be done by degrees, the pig left to suck perhaps once a day for some days with the above mentioned feeding.

Much blame has been attributed to the breed or blood, where the management has alone been at fault; I have witnessed so many disastrous effects from taking pigs abruptly from the sow and sending them on a long fatiguing voyage, that I have resolved that no pig shall go from me until it has passed the ordeal of weaning. No valuable pigs should be sent any distance without some interested person to attend them, who has had some experience in their management.

There is another source which has often proved fatal to whole litters of pigs, which is that of interfering with the sows at the time of their littering; the sow should have her litter at the place of her own choosing; it is the only place at which she will be at *home;* it is idle to suppose that dictation or interference of any kind can be of service to her; she is governed by an instinct infinitely surpassing human calculation on this point. I never interfere farther than to prevent all interference, and scarcely ever lost a pig.

Z. STANDISH.

Albany, June 25, 1840. [*Cultivator.*

PLANTATION GARDENS.

BY THE EDITOR.

IT was (and still is) our intention to compile a treatise on gardening adapted to the Southern States for publication in this journal. We are desirous, however, to embody in it all of the late improvements, and in order that we might do so, we sometime since forwarded orders to Europe for several horticultural works and jouanals which had been published within the few last years. Although that order has been given some time, yet the works have not as yet arrived. This will, we hope,

account satisfactorily for the few articles on horticulture which have appeared in our pages. We have little expectation now of carrying our design into execution, for at least several months. In the meantime, however, we will make such selections from other works as may seem likely to prove useful, both on vegetables, fruits and flowers. In the present number, we commence the republication of a series of papers on "Plantation Gardens," which were wrote in 1830, for the Agriculturist—with some slight alterations we shall give them as they originally appeared, for there are few subscribers of the Cabinet who were then subscribers to the Agriculturist. [Ed. So. Cabinet.

ON PLANTATION GARDENS, AND THE CULTURE OF VEGETABLES.

Independent of the ground allotted for the garden of the proprietor, there should be attached to every plantation, a piece sufficiently large to grow such quantities of the more common vegetables on, as may supply the wants of each slave on the place. By pursuing this plan, their health will be improved and their condition bettered, inasmuch as their diet may be more varied than it now generally is. But little attention, if any, has been paid to this subject by our planters, owing in some measure to its never having been presented before them, and partly to a supposed difficulty in the rearing of vegetables, and perhaps to a want of proper instructions on the subject. But the management of gardens, such as we would wish to see established on every plantation, would not be attended with so much difficulty, or require as much labour as the private gardens of individuals; in the latter, the appearance of every part must be regarded, and they must be kept in excellent order, that they may be both productive and pleasing to the eye of visitors. This need not be attended to in the plantation garden. The vegetables we would cultivate here, should be those that are common, and the greatest number of these may be attended principally with the cultivator or plough. Here the appearance of the ground will not be regarded farther than it may be necessary for the better culture of the crops. The product alone should be deemed worthy of attention.

The establishment of these gardens may be objected to on the plea—first, that it would be substracting from the productive labour of the estate, that is, from that part from which our income is derived; and, secondly, that each slave has ample time and sufficient ground to raise as large a quantity of vegetables as he can desire: and that generally he has every facility offered him for effecting this. To the first we reply, that the labour required will take but little from the effective force of the plantation, as it may principally be carried on by half hands and children, with the assistance of the plough and cultivator. To the second, that the indolent nature of negroes, so well known to us, and the experience of our whole lives, forbid us to expect that they will ever be induced to undertake the least work which does not result in their immediate benefit, without coercion, for, of all beings, the negro appears to be the most indolent, and the most improvident. But should this objection be deemed of sufficient weight, yet there are two plans by which what we propose may be effected. The first is to attach a small garden to each cottage, and compel the inhabitants to keep it in order, and to sow, plant and transplant the various vegetables as they come into season; and in this they should be governed by the gardener of the plantation, who should have it in charge to supply such seeds as each required, (all of which, with a very few exceptions, may be raised on the plantation,) and to raise a supply of cabbages, tomatoes, peppers, and other plants, as will be equal to the demand for them, and also to instruct such as are ignorant, in the proper method of cultivating each vegetable and the best mode of doing it. This last duty would, in all probability, cease after the first or second year. Nor would it be a great addition to the labour of the overseer, if he were instructed by the proprietor, that he should see that each one kept his garden in good order, and followed the directions given by the

gardener as to the time proper for the execution of each work. The quantity of manure which would be required, may appear at first to be an obstacle of considerable magnitude, but compost manures generally answer better for vegetables than either animal or vegetable, alone; and if each would only be careful in collecting all the manure that he could from his hen-house and hog-pen, and mix these in small quantities with mud from the swamp, or the rich top soil from the woods; and if he lives near to the sea-board, either add a little of the salt-mud, or sprinkle the whole over with salt water, he would possess enough, and of the richest quality—moreover, he could add to this, all the ashes from his hearth, together with the sweepings of his house, and all the slop and filth which usually accumulate around a negro's dwelling. The second plan that we offer is, that a large garden be laid off, and placed under the superintendance of one intelligent negro, and that every slave be compelled to work a certain number of hours, *each week* in it, under the direction of the head gardener. Perhaps it would not require an average of more than a half, or at most, an hour's work from each hand, per day, and the increased comfort not only of himself, but of his family, would surely compensate him. This, perhaps, is the more eligible plan of the two, and we will proceed to give such instructions as will enable the planter either to carry it into execution in this way, or, (as we would prefer,) by persons allotted for this special work. And here we would premise, that in the directions we shall give, it will be our object to economize time, labour, and manure; and that, consequently, the operations carried on according to these, will not have the neat appearance which we are accustomed to associate with a garden. The greatest product with the least labour, will be the object we shall aim at, and although the directions we may give may differ materially from those we have been accustomed to, and appear extremely slovenly in practice, yet what we shall state, shall be the result of actual experience.

We would select for a garden, a light loam, and if possible, a part of the garden should embrace a portion of low ground, well drained, which will be highly useful for cultivating all of our summer crops on, and will be almost absolutely necessary for one or two of the vegetables we propose rearing. Its form should be either a square or an oblong, as these afford more facilities for using the plough than any other—this is of importance, as we intend making free use of this instrument in all of our operations. Having selected the spot, it should be enclosed by a substantial fence or hedge: the latter is preferable, and if the nondescript be used, it will soon afford protection to it, from the depredations not only of animals, but also of the negroes of the plantation, who very often have strong propensities to give freely to their acquaintances of the neighbouring plantations, what belongs to their master. The area should be divided into squares by paths of eight feet in width. These paths will be necessary for the introduction of the carts with manure, as well as to carry off the product and the offal. The squares ought not to be less than one-fourth of an acre, for if they be small, there will be much loss of time in turning so frequently, as will be necessary, when using the plough. If the whole space be small, it will be as well to divide it into two equal divisions, by a road through the centre, and plant the vegetables across these, in contiguous rows. As to manuring, it will always be best to spread the whole over the surface, (especially if it be long,) and plough it under; but this will require a larger quantity than will be necessary, if used in drills, on which the vegetables are to be planted. Having laid out the ground, the next step will be to prepare it for receiving the various crops, and for this purpose, as large a plough as can be had on the plantation, should be used, and with this the ground should be broken up as deep as possible, and afterwards made fine with the harrow. It may require several workings before it is brought to this state, but these must be given now, as it will render the future workings more easy; and it must be borne in mind, that for all vegetables the ground should be well pulverized, and for many that it should be done very deep. We will endeavour, as much as possible, to give the culture of each in the order in which they will be required from this time. We will commence with the cabbage, as it is in such general

request, and as this is the seasou when it should be attended to. Before proceeding in our directions, we would observe that the neighbourhood of Charleston is intended, when any date is given, as to the proper time for executing any operation.

CABBAGES.

For these a seed-bed should be prepared. The ground should be well manured, broken up, and made as fine as possible. It should then be divided into small beds of four feet width, which will give much facility for weeding the young plants; across these, drills should be drawn about an inch deep and three inches apart, into which the seeds should be scattered very evenly and *thin*. Most persons err in sewing these too thick, in consequence of which the plants are drawn up, and become feeble; and if the transplantation be long delayed, many of the plants are lost, especially if it be in summer. In the spring of the year and the autumn, the seed bed will need no protection, but during the summer months, unless this be afforded them, the germinating qualities of the seeds, however good, will be destroyed by the sun, and even if, from a combination of favourable circumstances, they should germinate and come through, they will be very liable to be killed. The best mode of protecting them, with which we are acquainted, is to make a slight scaffold over them, about three feet high, and on this to spread a number of green bushes, sufficient to shade the ground completely. The density of this shade will continue as long as needed, which will be during the germination of the seeds. All plants, as soon as they are up, require heat and light: the first will be abundantly afforded by the temperature of the soil and atmosphere, without the direct influence of the sun, which, as we before stated, would prove at this time injurious. The height of the scaffolding will permit a sufficient quantity of reflected light to pass to the young plants, and as they advance in their growth, and require more of both of these, the demand will be answered by the falling of the leaves from the branches used as a covering—thus, gradually affording as much heat and light as they require, until the whole having fallen, the plants are exposed to the full rays of the sun—a few dried branches alone intervening, which may, or may not be taken away. The seeds for such plants as may be required in spring, ought to be sown late in autumn; should this not be done from any cause, they may be sown during the winter; but they run much hazard of being killed during some of the cold spells, especially when very young. A scaffolding should therefore be erected over them, but nothing placed thereon. Hay, straw, or even green bushes, should be provided, and on the approach of cold weather, they should be thrown on the scaffold, which ought not to be more than eighteen inches high; this should be removed on the recurrence of mild weather. The plan of protecting them by throwing the straw, &c. over the plants, is bad; as, in the first place, this is not always effectual; and, secondly, very many of the plants are destroyed by it. The sowing of the seed should take place six weeks or two months previous to the time intended for setting them out, as they will take fully that, to reach a proper size.

The varieties commonly grown among us, are, the Early York, Sugar-loaf, Battersea, Green-glazed, and Drum-head, which mature in the order in which they are here named. These are all excellent, but we would prefer the three last for the plantation garden. Although cabbages can be had at all seasons of the year with us; yet they are in their greatest perfection during the winter, those grown for summer use, are generally very indifferent, and scarcely repay the trouble of raising them. For the winter, the Battersea and Drum-head should be chosen, but for the *late* spring, summer, and *early* autumn crops, the green-glazed variety only, can be used with advantage. At those seasons of the year cabbages are subject to the destructive depredations of worms which prey upon their leaves, and render the whole plant unfit for use. The Green-glazed cabbage, from some cause or other, is almost entirely exempt from this, and forms a strong contrast, exhibiting its large broad leaves entire, while those of every other variety are completely riddled.

and more resemble honey combs than leaves. But this variety is coarse, and not to be recommended when the others are to be had. We therefore suggest the propriety of sowing the Green-glazed cabbage-seeds in February, March, April, May, June and July, and transplanting them as soon as they are large enough. They will be fit for use in the months of July, August, September and October, and will continue good during the winter if not used. During all of the other months, the Battersea and Drum-head should be sown. The seeds sown in September and October, which will be for the first spring crop, ought to be from Europe—those of American growth will send out seed stalks early in the spring, sometimes without heading, whilst those from English seeds, will cabbage, and remain firm. Those intended for summer and autumn use, should be from American seeds, as plants raised from European, cannot at those periods withstand the heat of our climate.

The preparation of the ground for the crop, next demands our attention. It should be ploughed and harrowed, until it is brought into a fine tilth; let the plough then lay off furrows three feet apart, and as deep as can be done by its passing twice through each: into this the manure should be spread, in considerable quantities, as the cabbage can scarcely be manured too highly, and well repays the quantity allowed it. Animal manures are undoubtedly the best; but we have used a compost made of animal manure and marsh-mud, with very great effect, and the cabbages were superior to those where the mud had not been used. After the manure has been spread, the plough should return and cover it, by throwing a furrow on each side. If it is intended to cultivate them on ridges, they may be left in this state, but if a level surface be preferred, the harrow should be passed over the tops lightly, taking care not to disturb the manure buried beneath. The plants should now be removed from the seed-beds, (selecting the largest,) and transplanted on these rows, at the distance of from two to three feet apart—this distance must be regulated by the variety and the richness of the soil, or quantity of manure used. Should the earth be dry, water should be poured into the holes where the plants are to be set, which is better than watering them after they are planted out. Except during the winter, they should be shaded until they have taken root, by sticking a bush to the south of them. The after culture consists in keeping the ground very loose and clear of weeds; if they have been planted on ridges, they may be worked by the plough, which should run as near the plants as possible, throwing the earth from them; it should then immediately return it to them, which will leave the ground in a very loose state—near to, and between the plants on the ridges, the hoe must be used. If the plants have been set out on a level surface, the cultivator may be used with great success, and if two of the tines only be used at first, they may be run very near, so as to leave but little work for the hoe to do. These workings may be repeated whenever it is thought the plants require it. At each ploughing a little additional earth should be thrown to the sides of the ridges; and the oftener these workings are repeated the better, as few plants will so well repay this frequency of work. The Early York, will require at least two months from the time they are transplanted, before any of them will head. The Battersea and Sugar-loaf, about a fortnight more, and the Drum-head about three months. This knowledge enables us to judge of the proper time for setting out each, which should be the length of time above stated, prior to the time they are wanted. For a winter crop, it is best to sow the seeds *on poor ground*, in April, and let them there remain until the months of July and August—they will be much hardier plants than those raised from seeds sown in June and July. The most eligible months for transplanting cabbages, are July and August for winter, October and November for early spring, and March for late spring crops.

RUTA BAGA.

The culture of this root does not differ materially from that recommended by us for cabbages. The ground should be put in good order by the plough and harrow, and furrows run from two to three feet apart—some have recommended greater distances, and Mr. Cobbett has even allowed four feet between the

rows, but this distance does not appear to us to be necessary, and those recommended above will be found amply sufficient. Into these furrows the manure should be spread very thick, and the earth formed into ridges over it, on which the seeds should be sown. We have cultivated them on level surfaces, and at less distances, but have never found them as luxuriant or succeed as well. Soon after the ground has been prepared as possible, the seeds should be sown. If it is intended to use the plants, which may be thinned out to fill up other compartments; they may be drilled along the whole length of the ridges, but if they be not wanted for this purpose it will be a great saving of seed to sow only a few every seven or nine inches, to be afterwards thinned out. Soon after they make their appearance it will be necessary to go over the ground, hoe the tops of the ridges, and loosen the earth around them. A short time after, let the plough be used, running as near to the plants on each side as possible, throwing the earth from them, this will leave small beds or ridges of six or eight inches diameter. The hoe may now be used again, to destroy all weeds which have sprung up, and also to stir the soil around the plants. The earth should then be returned, by the plough, which will generally have the effect of destroying all weeds and grass which may have grown on the side of the ridges. This course of culture is to be pursued whenever the plants require working, with this addition, viz. that at every working, an additional furrow should be thrown to the sides, so as to increase the width of the ridges. As soon as the plants are large enough to handle they must be thinned out, unless wanted for the purpose of filling up vacancies or setting out into other places; in this case they may be left until they are from four to five inches high. It must be borne in mind, however, that the sooner they are thinned the better, for all plants are injured by being crowded even with their own species as well as by weeds.

It is not a usual practice among us to transplant the Ruta Baga for a crop, yet it has many considerations to recommend it to a favourable notice and adoption. In the first place, there is great saving of seed, (as almost every plant may be used,) in the second place, there is a greater certainty as to the time when a crop can be got in; and, thirdly, there is less labour in the attendance. These we know to be facts, and will, we think, be made apparent to all in the course of the observations we shall have occasion to make on this part of our subject. The usual, and perhaps the best time for sowing this crop, is from the last week in July to the beginning of September: during this time we have frequent showers, but these are seldom of long duration, and the succeeding days are generally clear, accompanied with great heat and a burning sun; hence it often happens that the seeds have to be sown several times before a regular crop can be obtained, the germinating qualities of the seeds being either destroyed, or the young plants killed soon after they are up. There is then at this period a great loss of both time, labour and seed. It is true that sometimes there occurs a spell of rainy, cool weather, and if sown at this time there is every chance of succeeding. This occurs but seldom, and we are as seldom prepared for it when it does. But should we pursue the plan of either sowing on a seed-bed, and treating them like cabbage plants, or preparing only a small piece of the ground intended for the crop, and on this sowing the seed tolerably thick, we can at a very short notice, prepare the ground and put in the seed, and should there follow a succession of hot dry days, we can, from the small space occupied, protect the plants, and if necessity be, even supply them with water, which, however, will rarely be necessary. Again, it sometimes happens that the season is unpropitious for the sowing of this crop. The prevalence of a drought at this time may wholly prevent it, or occasion it to be delayed so long that only a meagre crop can be expected. In this case the seed-bed can be resorted to, and at the time others are only sowing their seed, and with but little prospect of success, we can be transplanting out our crop in good season, and in time to arrive at full maturity, and of course yield a large product. To many this plan may appear tedious, and requiring more labour than the sowing of the seed at once, on those spots where they are to remain, but this we are convinced is not so. Whenever the ground is to be occupied,

whether it be with seed or plants the preparation must be the same; the labour, therefore, in this respect is equal. If the seed is sown at once where the plants are to remain, the whole surface must be worked over about every ten or fifteen days, until the plants shade the ground. In the seed-bed they will not require this attendance, and even if they did, the ground to be gone over is insignificant compared with the other. They will seldom be fit to be transplanted out under six weeks, so that two workings at least will be saved, and the labour of transplanting an acre is less than hoeing it, in the manner required for turnips.

Many may suppose that the product from an acre of transplanted Ruta Baga, is not equal to that from an acre on which the seeds have been sown—the manuring and after culture of each being the same. But our own experience, and the experience of many of our friends with whom we have conversed, do not warrant us in coming to this conclusion; on the contrary, we have always found them fully equal, as far as we could judge from merely inspecting them; and this is also the opinion of others. Some even affirm that they are earlier, and yield a greater product; this, however, is mere opinion, for no accurate experiment has been instituted, that we are aware of, in this country. This tends to show, however, that the product is not visibly diminished.

In pursuing this course, the ground must be prepared in the same manner as recommended for sowing the seed, and no more should be prepared than can be finished in one or two days. It is best that all should be planted the same day that it is prepared, as the plants will take much more readily on newly prepared ground. The ridges being ready, select the strongest, and with a dibble insert them at twelve inches apart. Although this is an operation easily performed, and by which the transplantation is expeditiously executed, yet, except among gardeners, it is not generally understood—those who are acquainted with it will therefore pardon us for detailing what is so familiar to them. The dibble is a round piece of wood, about two inches diameter and fourteen long, made sharp and smooth at one end, (the handle of a spade, pointed, makes a very excellent one.) They are sometimes shod with iron to make them perform the work better, but when they are made smooth and of hard materials, this is not necessary.

Having the plant ready, proceed in the following manner: thrust the dibble down in an upright position, as deep as is necessary for the plant without doubling its roots; with the left hand insert it; placing the dibble about three inches off, and again thrust it down in a sloping direction, so that its point may arrive at, or a little below the point of the plant, force it now to an upright position with a sudden jerk, which will fill up the hole first made, and bring the roots of the plant in close contact with the earth; a slight stroke on the side of the bed fills up the last made hole. Some little dexterity, as well as force, must be used, so as to press the earth firmly around them. In order to know whether this be done efficiently, take hold of a leaf, if firmly set, the peice will separate from the plant, but if the plant comes up, the earth has not been compressed around it sufficiently. In performing this operation, it is all-important that the earth should be pressed close to the points or ends of the roots of all plants, to insure their growth—it is not enough that it should be drawn around them at the surface, and it is owing to inattention to this, that so many are constantly lost when set out. If the seeds are sown in August, the plants will be ready to be transplanted in September and October. It is seldom that we are troubled with much grass after those periods, and the plants themselves will soon overshadow the ground. Although there should not be weeds enough to make it necessary to work among the plants, yet the stirring of the soil ought not to be neglected; every operation of the kind is of immense value to the plants, as it not only prepares more food for them, but also loosens the earth, and enables them to push their roots in every direction in search of it, which, without this, would be out of their reach, and from which they would be as effectually cut off as if it had not been placed there. A small quantity of manure with frequent tillage, will produce a greater crop than a much larger supply with little or no tillage. Our limits will not permit us to discuss this point, but every planter who has been careful in his observations, must have witnessed this at some time or other in the course of his operations.

In ordinary seasons, those which are sown in August will produce roots sufficiently large for use in November, which will continue to increase in size during the winter, and remain good till late in the spring. We have said that August is the best month for sowing the seeds, should this have been omitted, or prevented by any cause, they may be sown in September, and perhaps even early in October, but these late sowings will not succeed so well. It is useless to sow any in the spring of the year, for they cannot withstand heat, but require cold weather to perfect themselves. Of the value of this crop in an agricultural point of view, we have said nothing, having confined ourselves to it as a crop for the plantation garden; but we cannot dismiss it without strongly recommending it to the notice and general cultivation of our planters, for the purpose of feeding their stock, for which they will find it well adapted, being very productive and highly nutricious.

[TO BE CONTINUED.]

COLLECTIONS AND RECOLLECTIONS.

PROPAGATION OF DOUBLE STOCKS.

SLIP off the side shoots in the early part of the summer; and having pared the lower part quite smooth with a sharp pen-knife, plant them in a mixture of light earth and sand, under a hand glass, and scarcely one will fail to grow.—*Irish Farmers' and Gardeners' Magazine.*

CULTURE OF THE TULIP.

Dig over the ground intended for the Tulip-bed about the end of July, or early in August, to the depth of two and a half or three feet. The ground best adapted is a fine rich loam, with a south exposure; and if the subsoil be clay, mix well with sea sand when digging, taking care to keep the upper stratum of the bed uppermost. If it be a light or gravelly subsoil, add some well mixed cow-dung and turf-mould in the bottom of the bed, until within about a foot of the surface. Dig over the bed again to the depth of eighteen inches, immediately before setting the bulbs, making the mould as fine as possible, and add some sand and decayed leaves, which have been previously well mixed in the proportion of three parts of sand to one of leaf-mould. The best time for planting is from the middle to the end of September, if the weather be dry; or any time from that until the middle of October, will produce a beautiful blow early in the spring.—*Irish Farmers' and Gardeners' Magazine.*

PLANTING TULIPS IN POTS.

Choose pots about eight inches in diameter, put a layer of two inches of common earth at the bottom, and another layer of two inches well mixed garden-earth, turf-mould, and cow-dung, in equal quantities, filling the pot with a compost of two parts of fine rich earth, and one part each of leaf-mould and sand, which has been previously well-mixed, and cover the bulbs to the depth of two and a half or three inches. The convenience and beauty of this method of cultivation will be evident to all. Great care should be taken to raise the bulbs as soon as the

flower-stalk and leaves begin to decay; and they should be kept in an airy situation, *not too dry*, until the time of planting.—*Irish Farmers' and Gardeners' Magazine.*

CULTURE OF THE PELARGONIUM, (GERANIUM.)

When the object is to produce abundance of plants, or to cause the plants to grow in the greatest luxuriance, plant them in rich friable soil, in a sheltered sunny situation, in the open ground, in the beginning of May; they will soon push out shoots, which may be slipped off when two inches long, and each planted in a half-penny pot, (thimble,) and placed in a moderate hotbed, and shaded, where they will strike directly. They should not have any air given to them for a week after they are put into the frame.

The slips may also be planted in the open ground, in a shady border, in June, July, or August, where not one in a hundred will fail to be rooted in a month after they are put in; they may then be potted in penny pots, (sixties,) and removed into the frames, green-house, or window of a dwelling-house. They must not be too much crowded, or they will lose their lower leaves and branches, and be "*drawn;*" neither must they have much water; a little may be occasionally given to such as appear dry, and abundance of air must be admitted every fine day. Pelargoniums are very impatient of frost; the frame must, therefore, he well secured by hay, straw, or mats. In March, let the plants be shifted into twopenny pots, (forty-eights,) using always the richest loam which can be procured, and from this time forward supply them with abundance of air, light, and water, and the flowers will amply recompense the trouble.

PRESERVING PELARGONIUMS THROUGH THE WINTER.

Those who have no other way of preserving them during the winter, may take the plants out of the border at the approach of frost in Autumn, and having shaken the earth from the roots, hang them up, head downwards, in a cellar, or other dark room, where they will be secure from frost. The leaves and shoots will become yellow and sickly; but on being planted out, the latter end of March, or as soon as the frost is over, will very soon recover their greatest luxuriance.

ANOTHER METHOD OF PRESERVING PELARGONIUMS.

Take off slips in September, and plant them in a mixture of three parts clean sand, and one part light loam, in a large pot. The pot should be better than half filled with gravel, or broken bits of pot, before the compost is put in; it may then be filled with slips or cuttings; and those at the margin of the pot, if not the whole of them, will readily grow, and may be potted off or planted out in the spring. In this way, one hundred plants may be preserved in a single pot in a window.—*Irish Farmers' and Gardeners' Magazine.*

TALES, SKETCHES, &C.

For the Southern Cabinet.

A SKETCH OF THE ISLAND OF MADEIRA IN THE YEAR 1836.

BY CAPT. G—— T———, OF SOUTH-CAROLINA.

[CONTINUED FROM PAGE 423.]

MANNERS AND CUSTOMS OF THE INHABITANTS—AMUSEMENTS, &c. &c.

In consequence of the increased demand for the wines of Madeira, and the high price they at present command, (almost treble that for which they could be bought forty years since,) the income of the landholder has proportionably increased, and in the same ratio have their artificial wants; and many now live in the greatest splendour whose ancestors' wants were as easily supplied as those of a south-sea-islander of the present day. Chairs were a luxury unknown, except one for the head of the family, the rest all squatting upon the floor (which was usually of mother earth) when partaking of their meals, which generally consisted of a kind of broth called *sopas* (which they are fond of to this-day,) made of different vegetables, such as pumpkins, cabbages, sweet-potatoes, &c. qualified with a piece of fat salt pork. Sometimes, for a change, they had a dish called *cus-cus*, introduced amongs them by their neighbours, the Moors, from the coast of Barbary, or a dish of salted cod-fish well soaked in rancid oil—drinking but little wine—of tea they scarcely knew the use. Ladies of the highest rank were then dressed in a serge cloak and baise peticoat, and only put on shoes and stockings on particular occcasions. But a few only were taught to read and fewer to write. Now, they are taught all the modern accomplishments, and many the English and French languages, and certainly do credit to their teachers, excelling in drawing, embroidery, painting, and music, for which they have a great passion. Both sexes now dress in the highest style of English fashion, while most of the principal families have their card and music parties, routs, balls, &c.———The Islanders are very graceful dancers.——The lower class are not strictly honest in their dealings, and as there is no imprisonment for debt, much difficulty arises in collecting a just debt; theft is rather common—capital punishment is never inflicted in Madeira. For certain crimes, such as smuggling tobacco or soap, (the supply of which is by government contracts,) and similar offences, the criminal is banished to the Cape de Verd islands for a term of years, sometimes for life—when the crime is death the prisoner is sent to Lisbon, there to await his fate.——The highest gratifications of the natives are the church festivals and religious processions; their avidity for these spectacles is so great that they come from all parts of the island to see them, although it is constantly a repetition of the same thing—the

streets are crowded with the delighted multitude, and the windows of the houses, and balconies, are filled with ladies full dressed, to see and be seen. These processions consist of images of our Saviour, of the Virgin Mary, and of different saints as large as life, borne on the shoulders of penitents, who are completely concealed in blue cotton dresses, having only opening enough in the upper part to see and breathe through. They are accompanied by a body of the Catholic clergy in their splendid rich dresses, together with a detachment of the Military attended with bands of music. Besides the penitents carrying the images, there is another class more numerous who are obliged to follow laden with heavy stones, bars of iron, chains, &c. while some go through the streets lashing their bare backs with bunches of small wire or nettles, the blood following every stroke. This part of the ceremony is, however, in a great measure, done away with. Since the organization of the present government, the people seem to have come more to their senses, and are much less under the influence of priest-craft—the number of priests having been very much reduced and their powers limited.

They bury their dead within 24 hours after decease; they carry the body to the grave in an open hearse or bier, the face and arms exposed to full view, attended by a concourse of priests and friars, chaunting a funeral dirge—that is, when the relations are able to pay for it—then follows the friends of the departed, and a motley group bearing lighted torches, although it should be mid-day. When the corpse is consigned to the grave, (which is always within the church,) a quantity of lime and vinegar is thrown in to consume it, in order to make room for others. Relatives do not follow the deceased, it being presumed they are too much affected by their loss. Widows of rank do not cross the threshold of their residence for twelve months after the decease of the husband.———Prior to the year 1770, Protestants were not allowed burial, but were thrown into the sea; but now they have a neat little chapel and burial ground, but are not allowed either steeple or bells. The burial ground contains some handsome monuments erected to the memory of English noblemen and wealthy individuals who had resorted here for the benefit of their health, and died on the island. No spot on the face of the globe can be better calculated for the restoration of invalids afflicted with pulmonary disorders, the city of Funchal being situated at the foot of a lofty range of mountains which, rising immediately in the rear, protect it from the chill Northern blasts which so often prove fatal to invalids in cases of decline, and the temperature of the climate is very little subject to change, the city being only open to the South the thermometer is seldom lower in winter than sixty-five, and ranges from seventy-five to seventy-eight in summer. There are several medical gentlemen on the island whose long residence has made them familiar with those diseases, for the cure of which the afflicted from all quarters resort to the island, and consequently very successful.

HOUSE RENT—MARKETS—ACCOMMODATION FOR INVALIDS—LITERATURE, MORALS, RELIGION, &C.

House-rent is at present very low, owing to the number of elegant villas built within the last ten or fifteen years, wherein nearly the whole property of many wealthy individuals was swallowed up, whose profits in business not keeping pace with their expenditures, they were compelled to part with them for half their original value, so that estates which cost

the original proprietor from thirty to forty thousand dollars, may now be had at the rate of three hundred dollars per annum. There are no taxes or poor rates—the necessaries of life are as cheap if not cheaper than in America, and the luxuries more so. Notwithstanding, however, the cheapness of living, there are a great number of paupers, owing probably to the low price of labour and the greater portion wanting employment, for whom no provision is made by the government—consequently, the streets are thronged with beggars, who are a great nuisance to strangers, for by yielding to their petitions in one instance you encourage droves to follow you wherever you go. There is one old crone, in particular, followed by a very pretty child, (either her own or borrowed for the occasion, is uncertain,) which she tutors in the mysteries of asking alms, and thereby collects considerable sums from strangers, who for the sake of the pretty little girl, are liberal in their donations.———There are four different markets—the beef, the fish, the vegetable and fruit market, all well supplied; but the buildings are execrable with the exception of those for the latter article, which is exposed for sale in very neat booths built in a square at the West end of the town, surrounded by a neat Iron railing and planted throughout with fine chesnut-trees, forming a delightful shady promenade in the hottest part of the day. Here are to be met with all the different species of fruit produce on the island. Apples, pears, peaches, nectarines, apricots, plums, cherries, mulberries, figs, bannanas, oranges, lemons, citron, blue or purple, and white grapes of a variety of kinds, melons, &c. &c.—indeed, almost every fruit known amongst us in America. The beef of Madeira, though small, is nevertheless excellent—something between our beef and veal, and is sold at the rate of six cents per pound, Portuguese, which is about 25 per cent. heavier than English weight. The mutton is also superior, but not exposed in market; it is carried around, when dressed, to the different houses. Their pork is also small, but very sweet. Of poultry they have an abundance and cheap—a pair of ducks cost thirty cents, a pair of fowls from twenty to thirty. Of game they have wild pigeons, quails, partridges, snipes, woodcocks, wild rabbits, &c. The ocean supplies them with abundance of fish, though of no great variety. Among them are the jaw-fish, john-dory, pike, mullet, mackarel, turtle, cray-fish, crabs, shrimps, &c. There are no public hotels of any note for the accommodation of strangers. Some years since one was established near the custom house and called the British hotel, but for lack of proper management is little resorted to. There are, however, several boarding and lodging houses kept for the accommodation of invalids by very respectable English families, who for the most part, from failure in their merchantile concerns, have been reduced to this resource to obtain a livelihood, there being here no bankrupt laws to protect the creditor: but the universal hospitality of the inhabitants renders it almost superfluous to have a room of your own. All the natives appear to have a natural talent for poetry. Many of them have been educated in England, but literature in general seems to be confined to the clergy. They have no public library, and for their reading room they are indebted principally to the English residents; it is, however, but little frequented. Books are kept there in which are noted the arrival and departure of vessels. There are also files of English newspapers brought by the packets, monthly periodicals, and several foreign journals. In connexion with a very neat billiard room got up by subscription amongst the English

residents, is a small but select library of English works, with prints and sketches of the different scenery about the island, &c. With regard to morality the islanders may be considered as very relaxed—the religion which they profess (the Catholic) being so very accommodating, they find no difficulty in getting absolution for any little picadillos they may have been guilty of, and launch into sin again with impunity—indeed, the lower classes appear to have no definite idea of the weight of their moral obligations, and in the intercourse between the sexes approach nearer to the brutes than to the lords of the creation.———Since the reorganization of the Government under the Constitution, the priests have been curtailed of most of their power, their number reduced, and their influence with their convents much abated. Numbers hostile to the present Government and state of things were obliged to fly, leaving their property behind them. The remnant now left, lead a very idle life, and are to be met with, lounging about the shops and other public places in every direction throughout the city. Their dress is a loose robe fastened around the middle by a cord with tassels, and flowing to the ground, the skirt is held in the hand when walking, or pinned up behind to keep it from sweeping the streets. On their head they wear a cap or three cornered fur hat, according to their rank in the church—are generally a jovial looking set, and seem to take the world easy. About three miles in the rear of the town and up a very steep but well paved road stands a very neat church, dedicated to our lady of the mountain, or *Nossa Senhora du Monte.* It is in the form of a cross, has two lofty turrets at the two front angles, is built of stone, plastered, and white-washed, and forms the most conspicuous object in approaching Funchal. It contains a good organ, some paintings from Scrtpture, figures of Saints, one or two altars, and the image of our lady of the mountain, which is enclosed by a glass case, on the principal one; it is about two feet in height, ornamented with a flaxen wig, and richly dressed. She was formerly decorated with a profusion of gold chains and precious stones, bequeathed her at various periods by pious devotees, but they have now all disappeared. This image is always pointed out to the stranger as an object of rare excellence by the curators of the church, and is reverenced by them accordingly. After the devastation occasioned by the flood of 1803, it was carried in procession to the town with great pomp, being attended by the principal clergy and the civil and military bodies, it being believed by all true Catholics, that her presence would prove a protection from any further deluge—and after being some months in the cathedral, was carried back to her old habitation in the same solemn manner. The church dedicated "to our lady of the mountain" is built on the spot where, according to monkish authority, she was originally found soon after the discovery of the island. She is said to have performed numerous miracles—one in particular is related of her, which is generally credited by the ignorant. During a time of great scarcity in Madeira, owing to the capture of American vessels (from whom the island was supplied) by British cruisers in the revolutionary war with America, supplication was made to the "lady of the mount," accompanied with a public procession, &c.—the following morning, at day break, a ship was discovered, which proved to be laden with wheat from Portugal; and on repairing to the mount church they found the saint's clothes dripping with wet, which on being examined by the priests, was

pronounced to be sea-water; the conclusion drawn from this circumstance was, that she had taken a trip to sea during the night to hasten the arrival of the vessel. The sailors were astonished when on their arrival they heard of the miracle, but afterwards recollected, that being becalmed off the island just after sun-set, they saw something white ascend from the waves (most probably a sea-gull) which hovered about their vessel, and immediately they felt her impelled towards Funchal—the miracle was thus confirmed!!!——Pilgrimages were daily made to the temple of "our lady"—nor was the hardy seaman last in paying his vows. It was the custom for the sailors when safely landed upon the island to go about the streets begging alms wherewith to pay the priests for saying masses at her altar. Frequently, an entire crew, headed by their captain, were to be seen trudging barefoot up the steep road that leads to the church, carrying their sails with them in procession, accompanied by a sworn appraiser, who, in presence of the priest, affixed a value on them. The value thus determined was then paid into his hands to defray the expense of celebrating masses at the shrine of the saint. A grand festival is held annually in honor of the "lady of the mountain;" it begins on the 4th August, and lasts till the 15th of the same month. During this period the church is decorated externally with flags of all nations, while drums and fifes are playing throughout the day in the portico of the church, and every evening the temple is superbly illuminated, and a display of fire-works is exhibited. On the 15th, which is called the day of "our lady of the mount," there are generally collected as many as twenty thousand persons from all parts of the island, being attended with a vast deal of bustle and confusion. The church is approached by a flight of sixty-six stone steps, up which the pious devotees, both men and women, crawl on their bare knees, dressed in their best apparel. On one occasion, a male penitent, in his zeal to accomplish his vow, by accident tore the train of a fair damsel who preceded him, on which she turned to him and said, "Oh! thou devil's baby thou shalt roast in hell-fire for thy carelessness!" when she resumed her occupation of telling her beads, while she crawled up the remainder of the steps.——Few strangers visit the island without visiting this delightful spot, it being situated in the midst of groves of tall chesnuts, and commanding an extensive view of the interior, and of the Atlantic ocean.

[TO BE CONTINUED.]

For the Southern Cabinet.

FRANCIS OLDERBY.

A TALE.

BY A PLAIN GENTLEMAN.

[CONTINUED FROM PAGE 431.]

V.

FRANK travelled as far as Georgia—was dissatisfied there, and went to Alabama. Here he met, in one of the hell-holes of dissipation which disgrace that fine country, with a professed and subtle gambler. A compact was formed between them—and in the end, though Fortune at some moments smiled on and flattered him, Frank became fleeced by his brother harpies, and was almost a penniless vagabond on the face of the earth.——Sickened at heart, he abandoned, with the uncertain resolve of youth, the company and haunts of these vicious and fiend-like mortals. With little money, he crossed the lakes, and arrived at New-Orleans. Here, under the impression of a virtuous reform, and without any satisfactory credentials of character, but a natural gentlemanly address and favourable appearance, he obtained a situation as accountant in a respectable trading-house. In this new situation he remained for a time contented; but it was only the contentment which *variety* imparts. It served as a short respite from that which was both his antidote and bane—like a palliative to the ennui which is sometimes created from our most ecstatic enjoyments when too greedily partaken of.——Frank had acquired the practice of gaming early, and its delusions were pursued with such ardour and delight, that it became a second nature. Abandoning it for a short time, only gave it increased power in his vicious heart; his thirst for it became even startling to himself—and so far was he involved in this fatal vice, and though partially aware of his awful situation, he in vain tried to summon up moral courage sufficient to banish the tempter and inward devil.

New-Orleans was well calculated to feed this propensity, and Frank's resolution tottered and fell before the approaches of temptation. He nightly visited many of the gambling houses in the city, and much of his employer's money went into the purses of their inmates—the detestable enemies of morals and religion.

He had now become both thief and gambler—and, like Barnwell, was a self-condemned wretch.———Every being has his moments of reflection. The past will steal upon us; and Frank thought at times on what he once was, trembled at the sad reverse of his fortune, would occasionally shed a tear for his father, think affectionately of Miss Bridget—and pride often created a bitter remorse and shame. He, however, with the common tendency of despair, would dismiss this painful theme, and stubbornly avoid any thoughts of the past. He felt, by his weakness to reclaim himself, that his ruin was decided, and he gave himself no anxiety about the issue of his proceedings. The Prince of Darkness had complete possession of his fate, and the desperate victim, now sanguine in sin, willingly obeyed the mandates of his awful master.

VI.

On a winter's evening, when no light illumined the pathway of the listless stroller, but the flickering and sickly glare from the street-lamps, and the hum and jabber of the mixed and motley populace of New-Orleans had scarcely died away from the levy, Frank strolled along among the crowd who filled the walk, with the compting-house keys in his hand. He was apparently engaged in deep thought, and his eye was passive to all ulterior objects, when he was gently tapped on the left shoulder by a hand which was white and delicate, and which sparkled with many rich and brilliant rings. Turning hastily round, his eye was fixed on the form of the individual who saluted him.

"Frank, my son, how'do?" said the stranger.

"Sir!—ah——I observe——excuse me——I'd almost forgotten you, 'tis so long since we've met.——I'm doing very well. How have you been?" said Frank, with much confusion.

"As usual: a victim to Fortune's caprice! To-day, rich enough—to-morrow, poor enough. But, at present, I'm flush."

"I'm glad to hear it," said Frank, in a smothered voice; and his eye-lids gloomily lowered toward the ground, as a train of painful incidents passed across his mind.

"But why so distant—so cold? Indeed, I believe, 'pon my soul, you've really forgotten your old friend and boon-companion."

"No, Sir, *I've not forgotten you*," said Frank with much emphasis.

"What then? Why this change of manner? Have I wronged you?"

"Perhaps I've wronged myself."

"Aye, that indeed.——You did that same thing, when you left me while reaping a golden harvest," said the stranger, not appearing to take the intended meaning of Frank's words.

"No matter, Sir. We'll avoid the canvassing of this subject. It only breeds bitter feelings."

"Well said. You're a lad of metal—a true sportsman, or by the lord Harry, old Bill Lincoln wouldn't be your friend.———Come, what d'ye say for a glass of wine, or any thing which will revive former friendship and drive dull care away?"

"Well, Sir, I suppose Fate ordains that we shall be friends; and we'll drink old acquaintance."

"Frank—Frank, I see you've been studying philosophy lately, or some other d—d vile trash, which is only fit for hair-brained fools and crazy authors, who mope their time away over musty folios, deluging the book-shops with a pack of nonsense, which has been the cause of sending more crazy folks to the asylums in Europe, than would have peopled the army of the immortal Bony.——Have done with it, my son, and save yourself from hypochondriacism, consumption and lunacy. There's infection in their gabble.———If you read any thing, read Tom Payne, my boy."

"You're a man of extravagant opinions," replied Frank carelessly.

"Not at all, my son.——This world was never made for dry, selfish philosophy. We are placed here like a parcel of geese, not having any more sense in proportion to the part we are destined to perform—and, like them, we struggle for that which supports life. Let the student cogitate over his mid-night taper, and deduce more than this from his reflections, and I'll give him the best effort of my mace, or trick of my card."

"Do you think—"

"Ah, stop there, I see what you're after, and I'm in no mood for abstract arguments now. Come in, and let's drown our cares for the future in a glass of good wine."

"Agreed," said the weak and wretched youth, his countenance exhibiting somewhat of joy from the language of his subtle seducer.

This individual was the old companion of Frank, whom we rather unceremoniously mentioned in a preceding part of our narrative. Having learned the good fortune of his proselyte, in obtaining a respectable competency, he immediately availed himself of an opportunity auspicious of much booty likely to be abstracted from the till of the merchant.———He was a deep and subtle character. Naturally of an evil turn, he received a complete education from the unfavourable circumstances of his youth. He was thrown upon the wide world, by the death of his last remaining parent, when about nineteen years of age, a pennyless fop, without trade or complete education, owing to a wild desire of breathing the fresh air, and roving about the world, untrammelled by moral ambition, the intricacies of study, or any honest labour. Being placed in this precarious and trying situation, he must needs devise some mode to extricate himself from the dark and startling fate which seemed to await him. The devil, always ready to make a convert, was soon at his elbow.—He became a gambler; and his life up to the present date contained a sad and awful history of the vicissitudes and trials which this wretched class of beings invariably experience. He had learned to struggle firmly with adversity, and to receive the deceitful gifts of Fortune with a calm and passive mind. He possessed a feeling of consciousness that his joy and his misery were things only of ephemeral duration, and his tranquil eye and steady nerve could feel the issue of a throw, deal, or any other act of gaming, without *apparent* symptoms of sensibility.

To a novice in the ways of the human heart, Bob Lincoln would have appeared a happy fellow; but an adept would have marked him out as the veriest wretch. Happiness ne'er deigned to dwell in his tempestuous and cloudy breast, without the sombre gleam of fiendish triumph, which at some moments lightened the burthen of his melancholy fate, when successful in the darker deeds of man, could be considered so. He knew that his being was degraded and despised—consequently, envy, and an inveterate hate toward all who appeared to partake of the slightest gleam of happiness, was all he appeared to live for. He strove, therefore, to reduce all to a level with himself, and thereby rid his fate of remorseful monitors. This accomplished, and he would smile like a fiend on their sufferings. The thought delighted his irony nature that he was not alone in guilt and misery.

Lincoln was a master-spirit in working upon the passions. He knew that a temperament like Frank's, when clouded with misery and remorse, needed for its antidote a show of gaiety, friendship and pleasure—and though the fires of hell raged within his own bosom, he could with natural wile and depth, like a pliant and good sea boat, suit himself to any wind and wave. His face could counterfeit the human passions with as much ease and skill as that of the artful and long practised harlot.

When meeting Francis Olderby, his person indeed bore evidence of being what he termed "flush." Dressed in a garb of superior fineness, and exquisite neatness, the choice in colour of each piece also showed

the genius of a practical fop, and wild, dashing gamester. A rich gold chain escaped from between the folds of his vest, and a jewell'd repeater would be occasionally drawn forth from his fob to advertise the passage of time. A cloak of much elegance partly covered his under attire, and a shining and well brushed beaver enclosed a wig of dark brown hair, which inclined a little back, exposing to the beholder a brow broad and strongly marked with the outlines of thought. His eye-brows were bushy and grey with age, and though the optics beneath were quick and penetrating, there rested also a glassy dullness over them, and the vestiges of dissipation and declining nature, also spoke a history in their sickly lids.

We must now return to the more direct part of our narrative. Frank entered the wine-store, drank one glass, and then felt like drinking another, and yet another still, until he became as deeply inebriated as the gambler wanted him to be. Pliant and easily bent to the will of his seducer, and like all mankind when under the gas-like influence of this poison, he showed the secret character of his nature, leaned upon his enemy for protection and friendship, and was wholly his.——From this place they proceeded to the gaming-table. The mace was levelled at the ball—the cards were shuffled and dealt—the wheel of fortune, or roulette, was spinning around and kept in continual motion by the hand of a wretched looking old man, who sate by it, with piles of specie and rolls of bank-notes by his side—and with an eye like that of the watchful heron, he calmly scanned and viewed the persons of all around. Other gaming apparatuses were there, and harpies to the side of them, who knew and acted their parts in the performance of sin and seduction. Lights illuminated the room with a brilliant glare; and all seemed like enchantment and elysium to the unguarded and weak stroller, who perchance dropped in, first out of curiosity, and then excited by the strange delusion of the game, was induced to play, became ruined, and finally darting out like a madman, vented his vain and impassioned imprecations on the silent and listless air.

Frank and his old companion were partners in play, and came off even. It was growing late—they separated, and retired to their homes.

VII.

The sun that arose on the next morning, gilding the spires and roofs of the city with a gorgeous splendour, failed to animate the heart of Frank. Indeed, it made him feel an additional pang of misery—for so foreign was its dazzling effulgence and glorious and unsullied career to his cloudy and wretched fate, that his eyes shrank in agony and shame from its honest beams.

The populace were up, and in motley groups lined the walks and levy. All was bustle and life. The busy mariners were engaged in fixing the rigging of the vessels, loading, or relieving them of their cargoes. The dark, sullen Mississippi, floated lazily by, bearing along in its powerful course boats guided by some grotesque figure who sate at their sterns, a specimen of the lower order of French or Spanish—perchance by some antiquated African, whose dress and manner bore the impress of an education received from a fellowship among the early settlers of New-Orleans. The small steam-boats also plied their rapid course across the river to and from a small town called Algiers; and the

loftier and more splendid packets came down the river laden with cotton and passengers, while monstrous tow-boats, impelled by steam, came struggling against the powerful current with loud and deafening puffs, having seven or eight vessels in tow, and finally quaking about the margin of the shore, casting loose their several charges, and notifying the bystander of the finale to their morning's labour by the loud hissing of the disengaged vapour which oozed discordantly from their pipes. Along the edges of the banks, on ground which the water had deserted, the wretched pauper, perhaps cooked in a small pot on a few blazing chips his scanty and coarse meal—and near him boats laden with light merchandize attracted a crowd of trifling purchasers, whose confused and imperfect jabber appeared almost unintelligible to themselves, while the market places, both up and down, afforded a scene more varied and amusing. Tables outside of the enclosure, set out with cold viands, and small cups, invited the passer-by to partake of coffee—and fruiterers, with persuasive countenances, appealed to the crowd for patronage. Further up, and at the termination of the open building, boys and men, adepts in their calling, bore packs on their stomachs, supported by a leather-band around their necks, showed themselves ready, by the varied assortment of their boxes, to accommodate you from a "penny-whistle up to a German flute." Their forms were in a continued and perpetual motion, and their tongues articulated bad Spanish, French, or German, while their hands were employed either in poking some of their merchandize in your face, or else pointing to the suspenders, kerchiefs, or what not, which hung on their other arm, while their eyes impatiently wandered from countenance to countenance, painfully anxious of patronage.———The portly citizen filled his basket, and the poorer classes economically laid out their last shilling to the best advantage. All was bustle and confusion. Some flew this way and some that. The city was buried in an universal hum—and, literally speaking, self emolument appeared to be the prevailing passion of this motley populace.

Frank's mind was insensible to all this; and he stalked toward the counting-room guilt-struck, and fearful lest his misconduct should be discovered by his employer. Indeed, a melancholy presentiment came over his feelings on that morning, and he could trace no cause for it further, than that he was conscious of having strained the thread of his misdoings too far—so far, that a single shred only appeared to be remaining between him and final disgrace and ruin. Something too—a spirit call it, or what you may—seemed to tell him the hour was at hand: the crisis which would damn him forever.

He entered the house, and the very walls seemed to reproach him with the epithets of thief and villain. He had not power to approach the desk where the treasures of a generous employer lay. No. He was sick at heart, and desperate under a conviction of guilt; and he sat on a box of merchandize, and pondered on the past and present of his eventful and sad life. The memory of his old father indeed, for a moment, occupied his thoughts, and he brushed a tear-drop from his eye. This was all the grief expended for the misfortunes of that miserable old man; and he betook himself to think of things more closely connected with his present interest.

"What shall I do?" said he, "detection, I fear, is certain. I see no way of escape. All is dark and terrible, and no ray of sunshine comes to my relief. Wretched—wretched youth, pity that I were ever born.

Would that I could die—aye, die this very moment. Surely the tortures of hell cannot much surpass my present agony;—then what have I to fear? I shall never—can never, reform; and why live longer the victim of an awful and torturing fate?"

At this moment the merchant entered the room, and without addressing a word to his clerk, leisurely approached the desk. A frown was on his countenance, and various papers and letters were taken from their places and overhauled carelessly, while his eye alternately glanced at Frank, who shrunk from his gaze with downcast look and trembling form.

"Mr. Olderby," said he at length, "You informed me two weeks ago, that those bills which I placed in your hands for collection, were not paid. Well, Sir, thinking I could do better than you did, I called on those gentlemen, and were informed by them that they did pay you, which was proved by your receipts. Furthermore, Sir, thinking that you had forgot, I examined my bank book, and find no credit therein for those amounts. Now, Sir, what do you say to this? I want a satisfactory answer."

Frank stammered and looked confused. His brow was crimsoned with shame, and he had not power to utter a word in defence of his conduct.

"I see, Sir, by your manner, that you have ill-treated me."

"I must plead guilty, Sir."

"Am I to have no further satisfaction than this for my losses?"

"I have none other to give you, Sir; take my wretched body, and do with it what you like. I cannot suffer much more than I do now."

"Young man, you have touched a chord in my heart which makes me pity you. I believe you have been led away by some evil companions. Tell me in what manner you have expended my money, and if any of it can be obtained?"

"Only thirty dollars of it have I in my possession—the rest has been gambled away, and is not obtainable."

"Unfortunate youth! You have indeed been tempted by these monsters to make yourself both thief and wretch, and to defraud a man who has been your friend."

"Forgive, oh! forgive me, Sir!" exclaimed Frank, springing to his employer's knees, "You did indeed take me into your service when I was pennyless—have been more a father than a master, and like an adder have I given you poison in exchange for friendship."

"I shall think no more of it. Your services to me have perhaps been worth the seven hundred dollars deficient. Keep the thirty to defray your expenses, and leave my employ."

The merchant retired to the next room; and Frank gathering himself up, put on his hat, and staggered out of the house like one drunk with liquor. He strove to right himself, and to put as happy a face on the matter as his miserable feelings would allow; and he darted hastily through the bustling throng which lined the walks, anxious to reach his boarding-house, where he might be to himself, and retired from the eye of impertinent curiosity. He ate nothing during the day, but ensconced in his chamber, remorse and shame fed upon his heart like the earth-worm on the mouldering remains of mortality.

[TO BE CONTINUED.]

BALLOON ADVENTURE AT NIGHT.

MR. Holland, a gentleman of scientific habits, projected the enterprise which has strikingly signalized ærostation of our day. On Monday, Nov. 7, 1836—at half past one in the afternoon, the balloon rose from Vauxhall Gardens with a moderate breeze from the south-east. It passed over Kent. The weather was singularly fine. At five minutes past four they saw the sea. After passing Canterbury, the course altered towards the north, which would have carried them into the German ocean. The point was now to change the course in the direction of Paris. Ballast was now thrown out, the balloon rose in an upper current, recovered her direction to the south-east, and crossed the Straits of Dover in exactly an hour, about 3000 feet above the level of the sea.

It was fifty minutes past five, consequently the balloon rapidly plunged into the night. The aspect of the world beneath now became curious in the extreme. The whole plane of the earth's surface for leagues round, as far and farther than the eye could distinctly embrace, seemed absolutely teeming with the scattered fires of the population, and exhibited a starry spectacle below, that almost rivalled the lustre of the firmament above. Incessantly, during the early portion of the night, before the inhabitants had retired to rest, large sources of light, exhibiting the presence of some more exclusive community, would appear just looming above the horizon in the direction in which they were advancing, bearing at first no faint resemblance of some vast conflagration. By degrees as they grew higher, this confused mass of illumination would appear to increase in intensity, extending over a large portion of the view, and assuming a more distinct appearance, until at length as the balloon passed directly over the spot, it suddenly resolved itself into streets and squares, exhibiting the perfect model of a town, but diminished into curious minuteness by the height from which it was seen. In this manner the æronauts rapidly traversed a large space of the continent, embracing a vast succession of towns and villages, solely distinguished by their nightly illumination. One of those views singularly captivated their attention. They approached a district which seemed actually to blaze with innumerable fires, studding the whole horizon. As they swept along, they saw a central city in the midst of this circle of flame, with every line of its streets marked out by its particular range of illumination. The theatres and other public buildings, the squares, and all the more prominent features of the city, were indicated by the larger accumulations of light. They could even hear the busy murmur of the population—the whole forming an earthly picture of the most striking contrast to the darkness, the serenity, and the silence of the vast region above in which they were moving. This was the city of Liege, whose surrounding iron founderies formed the horizon of flame. This was the last spectacle of the kind which met their eyes. Thenceforth it was all midnight, every sound was hushed, every light died, and all was solemn and awful obscurity. Withdrawn from the earth, which was buried in the profoundest stillness, they looked to the heavens. There was no moon. The hue of the sky was intensely black, but the stars redoubled in their lustre, shone like sparks of the whitest silver. Occasional flashes of lightning in the north.

In a situation, which it was never in the power of man to describe

before, the sketch of night given by Mr. Mason, has all the interest of a new source of ideas. "Nothing," says this clever describer, "could exceed the density of night, which prevailed during this part of the voyage. Not a single terrestrial object could any where be distinguished. An unfathomable abyss of darkness visible seemed to encompass us on every side. And, as we looked forward into its black obscurity in the direction in which we were proceeding, we could scarcely resist the impression that we were cleaving our way through an interminable mass of black marble, in which we were imbedded, and which, solid a few inches before us, seemed to soften as we approached, in order to admit us further within the precincts of its cold and dusky inclosure. Even the lights, which at times were lowered from the car, instead of dispelling, seemed only to augment the intensity of the surrounding darkness, and as they descended deeper into its frozen bosom, absolutely to meet their way downwards." The cold was at the point of congelation. The oil, the water, and the coffee were completely frozen. Yet the sufferings of the æronauts were not severe, in consequence of their being entirely exempt from the action of the wind.

While they were thus rushing on with almost whirlwind rapidity through the ocean of darkness, yet almost unconscieus of motion, an incident occurred calculated to alarm them in an extraordinary degree. By the discharge of ballast the balloon had suddenly risen to an elevation of about 10,000 feet, (about two miles.) In a few moments after they heard a violent burst from the top of the balloon, followed by a loud rustling of the silk, and all the signs of its having been torn suddenly open. Immediately the car began to toss, as if severed from the ropes, and appeared to be sinking to the earth. A second and a third explosion followed rapidly, evidently giving the voyagers the impression that they were upon the point of being dashed to pieces.

But the alarm was brief. The great machine suddenly recovered its stillness, and all was calm again. The concussions were subsequently accounted for by the stretching of the network on the surface of the balloon, which had become frozen during the night. When the machine suddenly shot up into the higher atmosphere, it swelled, and it was the resistance of the frozen network to this swelling, which produced the successive explosions. The sinking of the car was an allusion, occasioned by the surprise and suddenness of the action. When the network had been relieved, and the balloon was thus suffered to take its proper shape, all was calm and regular once more.

During the darkness they were sometimes perplexed with sounds from either earth or air, so strongly resembling the heaving of waters against some vast line of shore, that they were tempted to think themselves speeding along the shores of the German ocean, or hovering above the Baltic. From this apprehension, however, they were relieved by their recollection that their course was unchanged. At length they saw the day, but saw it under the most novel and interesting circumstances. About six o'clock, after crossing the Rhine, the balloon rose to a considerable elevation, and showed them a gladdening glimpse of the sun. The view was now magnificent; the balloon occupying the centre of a horizon of three thousand miles in diameter and comprising in a single vast view scarcely less than eighty thousand square miles. The country that spread below, was a rich, undulating, boundless landscape, with the Rhine dividing it, and losing itself among the vapors that still

clung to the hills, or covered the valleys. The ascents and descents of the balloon still more varied the prospect. A rapid descent first hid the sun from their view, and they were wrapped in the night which still shadowed the lower regions of the air. Again they rose within sight of this splendid display: again lost it. And it was not until after they had made the sun rise three times, and set twice, that they could regard daylight as complete on the mighty expanse below.—They now thought of making their final descent. But the question arose—"where were they?" They saw below them ranges of forest, wide plains, and large spaces covered with snow, giving the rather startling impressions that they had passed the bounds of civilized Europe, and were hovering over the deserts of Poland, or the Steppes of Russia. However, they now resolved upon descending; and after two attempts, baffled by the failure of the wind, and the nature of the ground, alighted in safety, at half past six in the morning, in the Grand Duchy of Nassau, and about two leagues from Wellburg. The voyage occupied about eighteen hours, and was in extent about five hundred British miles.

[*Blackwood's Magazine.*

REVOLUTIONARY SCENES.

A SURVIVOR OF BUNKER HILL.

ONE of the gallant aids of Gen. Warren at Bunker Hill, we rejoice to learn, survives, in the enjoyment of a green old age. The Albany Evening Journal of a late date furnished an interesting sketch of the life of this veteran—Nathan Maynard—who now lives at Seneca Falls. Judge M. was born in Farmington, near Boston, in August. 1755, and is therefere in his eighty-fifth year. He was one of the early settlers of Oneida county, after the war, where he has held various public trusts, and was ten years a Judge of the county courts. A son, John Maynard, is now a member of the State Senate. Having joined the provincial army in 1774, near Boston, in the memorable battle of Bunker Hill, it was his fortune to be placed in a situation to give a more interesting and graphic account of the thrilling incidents of that day, probably than any other man now living. He was aid to General Warren, and he it was who carried the order from the commander to the officers of the several regiments of the American army "to withhold their fire until the firing should be commenced in the centre," by order of the General himself.

The following account of the action is from his own lips, as published in the Journal.

Col. Prescott took possession of Breed's Hill on the night of the 16th of June, 1775, and threw up a breast work of earth, which they called a fort. On the morning of the 17th, at daylight, the British discovered the work, and commenced a heavy cannonade from their shipping, and from Copp's Hill. Col. Prescott was reinforced in the course of the forenoon, by the regiments of Colonels Brown, Nixon, and several others.

Gen. Warren, who had been appointed by the provincial authorities of Massachusetts a General but three or four days previous, arrived on the ground about the middle of the day; he was in citizens dress and was on foot, as were all the provincial officers; he had not taken command by virtue of his newly received commission, but the several Colonels insisted upon his at once assuming the command and directing the movements of the day. The British troops were at this time landing and forming in order of battle. General Warren had no military staff, and required the services of some one to transmit his orders, and Colonel Brewer recommended to him his fellow townsman, Mr. Maynard, who was young, active, and had been long enough in the service to be well disciplined.

Young Maynard accepted the invitation of Gen. Warren to act in that capacity, and repaired with him to the centre The General immediately directed a breast-work to be constructed by doubling a post and rail fence, and filling in with hay which had been mown the day before.

In the meantime, dense clouds of smoke rising above Charlestown, communicated the awful intelligence that the town and been fired by the enemy, and aided in exasperating the American troops for the bloody affray that was to follow. The breast-work was completed to within thirty rods of the fort occupied by Col. Prescott, when the men were forced to quit the work and seize their arms.

The British advanced slowly in two columns, and when the whole were plainly in sight, Mr. Maynard carried the order from Gen. Warren to Col. Nixon, who lay on the Mystic River, "to reserve his fire until the firing should commence in the centre." Returning to the General, he was directed to carry the same order to Col. Prescott and the other officers along the line.

The breathless silence along the American entrenchments was now only broken by hasty words of encouragement and direction from the officers to the men. The British advanced to within ten or twelve rods of the American works, when they fired and commenced displaying their columns to form a line. At this moment, Gen. Warren gave the word, "FIRE!"—On the instant, the whole breast-work was in a blaze, and a report, like prolonged thunder, rolled along the line. The enemy were thrown into disorder, and were unable to form their line; a few successive well directed fires compelled them to retreat, which, though hasty, was conducted in good order. Gen. Warren ordered a cessation of the firing, on account of the scarcity of ammunition. The ground occupied by the advancing columns was nearly covered with the dead and wounded, who lay in heaps as they fell across each other. The wounded raised their heads in imploring attitudes, but neither their friends nor their foes could afford them relief. But few of the Americans were killed or wounded in this attack.

All was still as the grave until the front of their columns had passed over all their dead, when the American General, without waiting for the fire of his enemy, gave the word that was to consign hundreds to instant death. This fire was even more destructive than before, and the enemy retired in some confusion. The ground was now literally covered with the dead. The British fired but few shots, and those did but little execution.

The British now received further reinforcements, and a general officer from Boston, and advanced a third time, not in column, but in line.

They again marched over their dead, and a brisk firing commenced on both sides, which lasted nearly an hour, until the firing of the Americans died away for want of ammunition. The British then undertook to storm the fort. General Warren sent a reinforcement of about sixty men to Col. Prescott, and sent Mr. Maynard to inform him that he would send more men if he wanted them. Col. Prescott at first thought he had as many men as could stand to advantage, but detained Mr. Maynard until the result of the enemy's first attack should be known.—The enemy scaled the embankments with their bayonets. The Americant had few bayonets, but fell upon the foe with the breeches of their guns, knocked them down with cobble stones, seized and wrested their guns from them, and turned their own bayonets against them. Prescott was every where encouraging his men, and joining in the general melee, and shouting with his hoarse voice, "down with them—seize their guns—knock out their brains with stones—cobble stones are our cannon shot," &c. &c. The British were driven out a second time with great loss; a third time they advanced to the attack. when Col. Prescott, discovering that the Provincials had been driven from the hay breast-work, and that his retreat would soon be cut off, ordered a retreat. The retreat now became general, but was conducted in good order. Mr. Maynard was not with General Warren when he fell, having been detained in the fort with Col. Prescott.

Soon after the retreat commenced, Mr. Maynard found his elder brother John (the father of John Maynard of Syracuse) with a broken leg, and a British musket for a crutch, making the best headway he could from the enemy. He threw his wounded brother across his shoulder, and carried him amid showers of bullets beyond the reach of the enemy's fire, where he fainted from loss of blood; a ball had passed through his leg, and the blood flowed profusely; the bullet holes were plugged with wads of grass; the wounded brother was again shouldered and carried to Bunker Hill, nearly a mile from the battle ground on Breed's Hill, before help could be obtained. His unfortunate brother was soon cured of his wound, and served through the war, and before its close was promoted to the rank of captain.

A VISIT TO NIAGARA.

Niagara Falls, August 25, 1837.

MY DEAR S——: You say that you wish me to give you as correct an idea as possible how things strike *me*, individually, and to have no regard to the received opinions of others, or what they have said in relation to the objects which I shall attempt to describe. If you will take the trouble to read my plain, common-place remarks npon the places and objects of interest which I meet with in my travels, you are at liberty to do so, and I will endeavour, as briefly as possible, to gratify you.

When I closed my last I was, I believe, on my way to the Falls. About a mile or more farther, at a turn in the road, the cars stopped, and

we were told to look out. There in the distance, amid the mist, which rose in masses of fantastic clouds, this great cataract for the first time burst upon us in all its magnitude and sublimity. It was beautiful, *very* beautiful—but not what my imagination had painted it; not what the glowing descriptions which I had read, had led me to believe. I promised to give you my impressions just as they occurred to me, and do not cry heresy, when I say that at this first view I was disappointed. Every thing seemed on a smaller and more diminutive scale than I had anticipated. But I did not consider the distance of the fall, neither had I any means to judge of their immense height, since we were on the high bank, nearly on a level with the top of the fall.

It was about nine o'clock when we stopped at the Eagle Hotel. We went into the house hastily, changed our shoes for a thicker pair, (according to the guide books,) and in a few minutes were on our way to the bridge, which leads to Bath Island. I had never heard much about the Rapids, and therefore they broke upon me with a most surprising and overpowering effect. Standing upon this bridge, which seems sometimes trembling, as if near dissolution, you gaze up what seems a hill, and there behold these interminable torrents rolling down upon you in successive volumes of white-capped billows, or chutes, as they are called, of from ten to thirty feet high, for more than a mile in width. These immense torrents, unlike the curling surges of the ocean, have no retrograde motion, but onward—onward they leap—plunge after plunge, till, as they near the frail structure on which you stand, you recoil unconsciously with a sickening sensation, as if the next must inevitably overwhelm you. After crossing this bridge, we entered a small lodge, or toll-house, where the names of the parties were entered, and a small sum paid for the privilege of passing the bridge to view the falls; here were a great many curiosities—minerals, Indian dresses, implements and ornaments of various kinds—as well as refreshments. From Bath we crossed another bridge to Goat Island, and followed a winding path through the forest, where the trees, which seem to have stood for ages, covered with the names of countless aspirants for immortality, who thus seek to inform visitors of other times, that *they*, too, have seen, "this wonder of the Western world."

The first view we had was of the centre fall from the American side of Goat Island. This fall is eighty yards wide, and is separated from the great American fall by Luna Island, to which there was formerly access by a bridge, which has since been destroyed by the ice. This fall, though not so grand as the others, is perfectly beautiful. The river, just before taking its final leap at this place, becomes quite free from the froth and foam into which the rocks and rapids above have lashed it, and though hurrying rapidly along, is clear and limpid, till it arrives at the very edge of the precipice. There was a small, gnarled oak, which hung far over the boiling abyss, around which I firmly clasped an arm, and by this means securely gazed upon the changing clouds of spray, whose misty veils forever hide from human eyes its immeasurable depths. From this point we went to the lower end of the Island, where there is a staircase enclosed within a hexagon tower of wood called the "Biddle Stairway." It is descended by ninety steps, and the descent is rather a fatiguing operation. From the foot of this staircase, to the right, is a path leading to the "Cave of the Winds, or Eolus' Cave, which is under,

or directly behind the centre fall—and at the bottom is said to be more than a hundred feet wide, and is safely passed by visitors. There is also another path, to the left, conducting to the crescent or horse-shoe fall, where it is also said that persons can pass behind the ever-moving arch, when the wind blows up the river.

O my dear S——, I am afraid that I shall never be able to give you the most remote idea of this amazing cataract. In the first place, you must bear in mind that while we are on Goat Island, the bridges, Luna Island, &c., we are either a little *above* or on a level with the fall, but after coming down the staircase, we are on a level *with* the bed of the river, and of the awful gulf into which the cataract plunges. You now, for the first time, begin to realize the astonishing grandeur of the scene. Strange thoughts crowd into the brain as you gaze upward.

> "Color, depth, height, extension—all unite
> To chain the spirit by a look intense."

Several of us determined to go under the cataract to the "cave of the winds," and, picking our way over the loose stones and rocks that are continually falling from the cliffs above, we at last found ourselves at the entrance. But old Boreas disputed every inch of ground as an invasion of his territory. The imprisoned winds buffeted us as we advanced, and the blinding spray convinced us that

> "Through this airy hall, the loud misrule
> Of driving tempest is forever heard."——

Drenched and almost breathless, we turned (as did our umbrellas, wrong side out,) to retrace our steps, when to our astonishment we saw that no one had followed us. All but Mr. S——— and myself had become discouraged or fearful of the wetting, at the very onset, but the noise of the cataract had prevented our knowing when our companions left us. We went back to the stair case, but they had gone, and taken another path which led down to the river, and as we advanced, they all stood still, gazing down from some rocks on which they were standing into the water. We could not hear them speak, from the roar of the cataract, but they motioned us not to come. Supposing, however, they had found some curiosity, I determined to see what it was, and scrambled down the rocks to where they were standing, when, O horror—what should I see but a human corpse of gigantic proportions, bruised and blackened by its descent over the falls! Trembling and faint at the sudden and awful sight, I should have fallen had it not been for a protecting hand held out to save me. We afterwards learned the body was that of a person who had committed suicide by throwing himself in the rapids. O curiosity! thou sometimes fatal error of our sex—but were it not for thee, many of the glorious works of the Creator which I saw this day, would have forever remained a blank to me!

We could not get very near the Crescent fall, on account of the spray which the wind drove directly in our faces—therefore, we ascended the stairs again to have a view from the Stone Tower, near the end of the terrapin bridge, and on the verge of the precipice. This tower is also ascended by a winding stair, and commands an extensive view of both falls, as well as of the rapids above and the river below. The shores of Canada, too, show well from this point, but I forbear attempting to describe what is beyond all description. It has been correctly said by an English traveller that "all the parts of the Niagara are on so grand

a scale, that every effort of the imagination is completely baffled in attempting to describe it." The ordinary means of description, analogy, and direct comparison with things more accessible, fail entirely in the case of this wonderful cataract.

My enthusiasm had now reached to such a height, that the greatest exertions left no fatigue; no perils awed me. From the very topmost verge of the highest precipices, could I look unflinchingly down where none but the most bold dared to follow—neither was this accomplished in a spirit of fool-hardiness, but with a perfect unconsciousness of all danger. We expected to leave on the morrow; therefore, I determined to view, from every accessible point, the varying beauties of the scene. From the Tower we re-crossed the Island and bridges to the Ferry, which is but a few rods below the Great American Fall, and is reached by a flight of stairs constructed from the bank above.

When about a third of the way down, we came to a landing from the window of which there is the finest view, in my opinion, of the American Fall. It is a side, and half front view. The spectator is also so near the top of the fall, that he can see the water at the very instant of its coming over the precipice. It then *drops* down almost perpendicularly, a distance of one hundred and sixty-four feet, in an unbroken sheet of fleecy foam. It does not seem to come over with an *intention*, if I may use the word, but because it cannot help it; it has no where else to go. The crescent fall, on the contrary, comes roaring and thundering on, as if conscious from the very beginning, of its mighty purpose, and as it nears the fatal brink it apparently smooths its troubled brow, and with a placid composure and quiet dignity, slowly takes the awful plunge.

The American fall looses much of its sublimity and grandeur by a comparison with the other; but the terms beautiful and magnificent, are more frequently applied to it, and among the mass, it has, I think, as great a number of admirers. After descending the stairs, the spectator can approach, by a rocky barrier, to within a few feet of the falling sheet, though not without encountering a plentiful shower of the spray, which arising from the water in immense clouds of fantastic shapes, serve as a medium for the most beautiful rainbows.—But were it not for the ocular demonstration, that one is continually receiving in the face, eyes, and dress, of the presence of a liquid element, water would be the last thing of which you would think, as looking upward, you behold the silvery shining mass, separating into globules of feathery consistency, like flakes of driven snow or fleecy wool.

But I must haste to the Ferry, or you will tire of the description. Upon arriving there, I was surprised to see the diminutive little bark in which we were to cross the river. It was a row-boat of the smallest class, and manned by a biped of the Jim Crow species, who, by some accident or other, had lost his upper row of "ivories," and therefore cut a ludicrous figure. It seemed almost like tempting Providence, to trust ourselves on that foaming sea, in such a frail cockle-shell: but others did it with safety, every hour in the day—therefore, why should we fear? I did *not* at the time, and this has been an after consideration. In crossing the river, we had a most magnificent view of the whole scene. The boat sometimes bounded buoyantly aloft on the crest of a huge wave, or rather seemed tossed from one wave to another, like the feathered cork from battledoors.

Many who come to Niagara, go away without crossing the river, and yet flatter themselves that they have seen all that is worth seeing. This is a great mistake; for of all the other views, *this* and the one from Table Rock, are the greatest; but, indeed, one must see it from every point of view, to get a perfect idea of its unspeakable grandeur. The walk from the river to Table Rock, is very fatiguing, being up an ascent most of the way. I looked neither to the right nor to the left, till I stood on that temple of the Sublime and the Beautiful; for I wished the whole scene to burst upon me at once.

The first look from this high rock that trembles over the awful abyss, i truly indescribable. No words can delineate my sensations. All that I had ever imagined of the Grand, Beautiful, or Terrible in nature seemed embodied here. The "blended sorcery claimed both pulse and tear," and seemed almost to control the sources of life.

"Terrific, but, oh! beautiful abyss!
If I should trust my fascinated eye,
Or hearken to thy maddening melody,
Sense, form, would spring to meet thy white foam's kiss,
Be lapped in thy soft rainbows, once, and die."

In viewing the falls from most other points, exclamations of astonishment and delight are continually escaping from the spectator. He pours forth, in "thoughts that breathe and words that burn," aided by the kindling eye and glowing cheek, the emotions of wonder or admiration which the scene before him excites. But here the voice is involuntarily hushed, and thought mounts upward to

"Him whose word is Nature's birth—
Her dissolution, his suspended smile.'

"Yes, as a drop of water in the sea,
All this magnificence in Thee is lost;
What are ten thousand worlds, compared to Thee!
Heaven's unnumbered host,
Though multiplied by myriads, and arrayed
In all the glory of sublimest thought,
Is but an atom in the balance, weighed
Against thy greatness."

[*New World.*

THE DELPHIC ORACLE.

THE Greeks believed in the possibility of foretelling future events. The wisest among them were in this respect not more advanced in intelligence than those ignorant beings in the present day who put faith in fortune-tellers. The practice of divining what would be the result of important enterprises, was connected with the religion of the country, and thereby countenanced and supported by the state. In all matters of importance, the desired knowledge of futurity was sought for from certain oracles, or, as we should now call them, fortune-telling establishments. By far the most celebrated of the Grecian oracles was that of Apollo at Delphi, a city built on the slopes of Mount Parnassus, in Phocis. At a very remote period it had been discovered, that, from a

deep cavern in the side of that mountain, an intoxicating vapor issued, the effect of which was so powerful as to throw into convulsions both men and cattle. The rude inhabitants of the surrounding district, unable to account for this phenomenon, conceived that it must be produced by supernatural agency, and regarded the incoherent ravings of those who had inhaled the noxious vapor as prophecies uttered under the inspiration of some god. As the stupifying exhalation ascended out of the ground, it was at first conjectured that the newly discovered oracle must be that of the very ancient goddess, *Earth*, but Neptune was afterwards associated with this divinity, as an auxiliary agent in the mystery. Finally, the whole credit of the oracle was transferred to Apollo. A temple was soon built on the hallowed spot, and a priestess, named the *Pythoness*, was appointed, whose office it was to inhale, at stated intervals, the prophetic vapor. To enable her to do so without the risk of falling into the cavern, as several persons had previously done, a seat, called a tripod, from its having three feet, was erected for her accommodation, directly over the mouth of the chasm. Still, however, the Pythoness held an office which was neither safe nor agreeable. The convulsions into which she was thrown by the unwholesome vapors of the cavern, were in some instances so violent as to cause immediate death, and were at all times so painful that force was often necessary to bring the official to the prophetic seat. The unconnected words which the Pythoness screamed out in her madness, were arranged into sentences by the attendant priests, who could easily place them in such an order, and fill up the breaks in such a way, as to make them express whatever was most suitable to the interests of the *shrine*, which was the main object. Lest the oracle should be brought into discredit, care was, in general, taken to couch the response in language so obscure and enigmatical, that, whatever course events should take, the prediction might not be falsified, or rather might appear to be verified. It may be observed that, in course of time, the plan of simulating convulsions was most probably adopted by the chief agent in these impositions.

The fame of the Delphic oracle soon became very extensive, and no enterprise of importance was undertaken in any part of Greece, or of its numerous colonies in the islands and along the coasts of the Ægean and Mediterranean seas, without a consultation of the Pythoness. The presents received from those who resorted to it for counsel, not a few of whom were princes or influential and wealthy leaders, formed a source of great and permanent revenue to the institution, aud not only afforded the officiating priests a comfortable maintenance, but furnished also the means of erecting a splendid temple instead of the rude edifice which had been originally constructed. The high veneration in which the Delphic oracle was held give its directors a large share of influence in public affairs; an influence which they sometimes exerted in a most commendable manner, in sanctioning and furthering the schemes of the statesman, legislators, and warriors, who undertook to improve the political systems, reform the laws and manners, or defend the liberties of Greece.

AGRICULTURAL ITEMS.

Chemistry applied to Agriculture.—It is stated that the celebrated chemist, Lavoiser, cultivated two hundred and forty acres of land in La Vendee on chemical principles, in order to set a good example to the farmers. His mode of culture was attended with such success, that his crops amounted to a third more than those which were produced by the usual method, and in nine years his annual produce was doubled. Yet the generality of our yeomanry would as soon think of studying Hebrew, as the elementary principles of chemistry. *Gibbon's Adv. of Soc.*

Winter Food for Cows.—M. Charbert, the director of the veterinary school of Alfort, had a number of cows which yielded twelve gallons of milk every day. In his publications on the subject, he observes that cows fed in the winter upon dry substances give less milk than those which are kept upon a green diet, and also that their milk loses much of its quality. He published the following receipt, by the use of which his cows afforded him an equal quantity and quality of milk during the winter as during the summer:—Take a bushel of potatoes, break them whilst raw, place them in a barrel standing up, putting in successively a layer of potatoes and a layer of bran, and a small quantity of yeast in the middle of the mass, which is to be left thus to ferment during a whole week, and when the vinous taste has pervaded the whole mixture, it is then given to the cows who eat it greedily.

Soaking Corn to feed Horses.—A gentleman, who resides in Baltimore county, and who is one of the most successful farmers in our vicinity, informed us a few days since, that he saved at least one-third of his corn by the manner in which he fed it out to his horses. He has two hogsheads placed in his cellar, where they are secure from freezing. These he first fills with corn in the ear, then pours in a sufficient quantity of water to cover the corn. After the ears have been thoroughly soaked he commences feeding, gives to his horses *two-thirds* the usual quantity allowed.—As one of these hogsheads becomes empty, he refills it; and by the time the other is empty the one last filled is sufficiently soaked for use. In this way the cobs become so softened that the horses consume the whole of them, and they are thus made to add fully one-third more to his stock of feed. He assures us, that his horses eat the cobs with avidity, keep in good order, and are just as competent to perform plantation labor as when they consumed the grain alone. The success of our informant should stimulate his agricultural brethren to follow his example, as the labor of preparation is nothing, compared with the great saving effected. *Baltimore Farmer.*

Hoeing Ruta Baga.—An experienced cultivator of the ruta baga, may commonly be known by his leaving the plants about four times as thickly together as they ought to stand. On ground of any tolerable degree of fertility, the distance of one foot at least should be allowed between the roots, except they be in drills three feet asunder, when they may be suffered to stand a little nearer. If sown broadcast, eighteen inches square should be allowed to each root. If the land is rich enough, they will be so much larger in consequence of this increased space, as considerably to increase the amount of the crop, and greatly to diminish the labor of harvesting.

We have observed, on the best soil, well manured previous years, where the crop had been sowed broadcast, and two feet square allotted to each plant, roots weighing from ten to fifteen pounds, and yielding about fifteen hundred bushels an acre.

To Promote the Puberty of Apple and Pear Trees.—John Williams planted in pots, in Nov., 1809; transplanted after midsummer the following year into the open ground; transplanted again in the autumn of 1811, six feet apart—pruned away every winter the trifling lateral shoots, leaving the large lateral at full length to the bottom of the plants, and gave a good exposure to the sun. At height of six feet the branches ceased to produce thorns.

One yielded fruit at four years old, and several at five and six years.

Rep. of Arts. 1819, *p.* 175.

The Lilac.—By grafting or innoculating the purple and white lilac into each other, and forming a good top of the two kinds well arranged, a most beautiful appearance is produced by the white and purple flowers upon the same shrub.

Egyptian Cotton.—The exports of cotton from Egypt for the present year will amount to sixty thousand bales of three hundred and fifty pounds. Of this quantity there are five hundred bales of Sea Island cotton, which the Pacha has introduced into Egypt. The rest of the quantity called *maho*, from a triennial plant or cotton tree, which lasts three years. Egyptian cotton, from the length of its staple and fineness, commands the next highest price to our Sea Island. It sells for sixteen dollars the hundred in Alexandria.

Salt injurious to Turkeys.—A lady of this neighborhood observed that her young turkeys, coming up in the evening, had a disease called the "*snuffles.*" Expecting to relieve them, she fed the flock of about thirty, with say a pint of dough, seasoned with a large spoonful of salt. The next morning, to her astonishment, the whole flock except three or four were dead. To test the matter further, a portion of a similar mixture was fed to a chicken, confined in the coop on account of a broken leg, but otherwise in health. Death followed. Was the salt the cause?

MISCELLANEOUS ITEMS.

Good Nature.—Dame Grundy was the most good natured woman alive. Come what would every thing was right, nothing was wrong.—One day farmer Grundy told a neighbor that he believed that his wife was one of the most even tempered women in the world, for he never saw her cross in his life; and that for once he should like to see her so. "Well," said his neighbor, "go into the woods and bring her a load of the crookedest wood you can find, and if it doesn't make her cross, nothing will." Accordingly to try the experiment, he teamed home a load of wood every way calculated to make a woman fret. For a week or more she used the wood copiously, but not a word of complaint escaped her lips. So one day the husband ventured to inquire of her how she liked the wood. "Oh, it is beautiful wood," says she, "I wish you'd get another load, *for it lays around the pot so complete!*"

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Effects of the Natchez Tornado.—Dr. Tooley has published in the Natchez papers, some striking facts observed during the dreadful storm in that city.—The external rarefaction of the atmosphere was so great and rapid, that several houses exploded from the pressure of the air within. The leaves and the buds of plants were seared, many of them having their vitality destroyed, and the growth of others so much suspended, that they did not revive for eight or ten days after.—The latter effects are accounted for by the great influence exerted on the absorption of the plants from the sudden rarefaction of the air. They are peculiar to tornadoes, but are seldom observed to produce so marked an effect as is above stated.

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Insurance in Prussia.—A correspondent of the Cincinnati Gazette remarks, that the Prussian monarchy is perhaps the best regulated government in the world. In proof, the writer says,—"Every attention which a wise and provident government can bestow, is paid to the *welfare of the people.* This is evinced, in a remarkable degree, by the fact, that if a farmer's house be burnt, *the government restores it to the same condition* it was in previous to the burning; a fund being provided for the purpose by a small premium exacted in the shape of tax, on each house, and this tax so very small, is sufficient to cover the amount of losses."

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Subterranean Village.—"Accident," says the Progres du Pas de Calais, "has just brought to light an ancient subterranean village in the Commune of Hermies, near Bapaume. During the late heavy rains a considerable land slip took place, leaving an immense chasm, into which some of the young men of Hermies, with more courage than prudence, descended by means of ladders to the depth of about thirty yards. Great was their astonishment on finding themselves in the midst of streets bordered by cells and chambers, which evidently had been formerly inhabited. The streets are wide enough for a vehicle to pass, and the chambers, which are of different sizes, according to the exaggerated statements perhaps of the explorers, to 1400 or 1500. They were particularly struck by a winding staircase, which they descended, and at length discovered that it reached the bottom of the tower of the church at Hermies, into which they soon made a way. In continuing the progress of their researches the candles they had with them were extinguished by the foulness of the air, and they were forced to retreat. On reaching the spot where they descended one of the party was missing. His companions, though without any light, returned in search of him, and discovered him fallen into a well twenty yards deep. They succeeded in getting him out, but with one leg broken, and nearly suffocated."

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Advice to Young Ladies.—If you have blue eyes, you need not languish; if you have black, you need not leer. If you have pretty ankles, there is no occasion to wear short petticoats; and if you are doubtful as to that point, there is no harm in letting them be long.—If you have good teeth do not laugh for the purpose of showing them; if you have bad ones, by all means shut your mouth and smile. If you have pretty hands and arms, there can be no objections to your playing on a harp; if you are disposed to be clumsy, work tapestry. If you dance well, dance but little; if ill, never dance at all. If you sing well, make no previous excuse: if you sing indifferently, hesitate not a moment when you are asked, for few people are judges of singing, but every one will be sensible of your desire to please. If you have obtained power, be condescending; but above all, (mark!) if you are asked in marriage, say—"Yes!" for you will probably never be asked a second time.

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Taciturnity of Genius.—In conversation Dante was taciturn or satirical; Butler was silent or caustic; Gray and Alfieri seldom talked or smiled. Descartes, whose avocations formed him for meditation and solitude, was silent. Rousseau was remarkably trite in conversation—not a word of fancy or eloquence warmed him. Milton was unsocial, and even irritable when much pressed by the talk of others. Addison and Moliere were only observers in society: and Dryden has very honestly told us—"My conversation is dull and slow, my humor saturnine and reserved; in short, I am not one of those who endeavor to break jests in company, or make repartees."

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A Kentucky Rifle.—Among the company of a hunting party in Kentucky, the other day, was a man eighty-five years old who was as smart, and as true a shot, as the best of them!

An Old Story of a Confessor.—In a town some fifty miles from Boston, the members of a religious society were in the practice of holding conference meetings in the church, at which they made a kind of audible confession, technically called, recounting one's "experience." A very pious member of the church, Mr. D———, was in the habit of inviting his neighbor Mr. L——, who was not a member, to attend at these meetings, at one of which Mr. D——— got up and stated to the congregation that he was a great sinner—that he sinned daily, and with his eyes open—that he wilfully and knowingly sinned—that goodness dwelt not in him—that he was absolutely and totally depraved—that nothing but the boundless mercy and infinite goodness of God could save him from eternal damnation. After this confession of Mr. D———, Mr. L———, who had by accident been placed upon the "anxious seat," was called upon to recount his "experience." He arose, and with the most imperturberable gravity, stated that he had lived for five and twenty years the nearest neighbor of Mr. D———; that he knew him well, more intimately so than any other man, and it gave him great pleasure, because he could do it with entire sincerity, *to confirm the truth of all brother D——— had confessed of himself.* When Mr. L——— sat down under the visible and audible smile of the whole congregation, the parson not excepted, Mr. D——— went up to him and said, "You are a rascal and a liar, and I'll lick you when you get out of church. *Boston Post.*

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A Quaker's Letter to his Watchmaker.—I herewith send thee my pocket-clock, which greatly standeth in need of thy friendly correction. The last time he was at thy friendly school, he was no ways reformed, nor in the least benefited thereby; for I perceive by the index of his mind, that he is a liar, and the truth is not in him; that his motions are wavering and irregular; that his pulse is sometimes fast, which betokeneth not an even temper; at other times it waxeth sluggish, notwithstanding I frequently urge him; when he should be on his duty, as thou knowest his usual name denoteth, I find him slumbering and sleeping—or, as the vanity of human reason phrases it, I catch him napping. Hence I am induced to believe he is not right in the inward man. Examine him, therefore, and prove him, I beseech thee, thoroughly, that thou mayest, by being well acquainted with his inward frame and disposition, draw him from the error of his ways, and show him the path wherein he should go. It grieves me to think, and when I ponder thereon, I am verily of opinion that his body is foul, and the whole mass is corrupted. Cleanse him, therefore, with thy charming physic, from all pollution, that he may vibrate and circulate according to the truth. I will place him a few days under thy care, and pay for his board as thou requirest it. I entreat thee, friend John, to demean thyself on this occasion with a right judgment according to the gift which is in thee, and prove thyself a workman. And when thou layest thy correcting hand on him, let it be without passion, lest thou drive him to destruction. Do thou regulate his motion for the time to come, by the motion of the light that ruleth the day, and when thou findest him converted from the error of his ways, and more conformable to the above mentioned rules, then do thou send him home with a just bill of charges, drawn out by the spirit of moderation, and it shall be sent to thee in the root of all evil.

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Illustration of Early Rising.—The difference between rising at six and at eight, in the course of forty years, amounts to twenty thousand hours, or eight years, one hundred and twenty-one days and ten hours, which will afford eight hours a day for exactly ten years; so that it is the same as if ten years of life were added in which we could command eight hours each day for the cultivation of mind.

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There was once a coin in Massachusetts which bore upon its face the following excellent advice:—"Mind your business." And men who took its instructions to heart, treasured them up, and practiced upon their principles, always found more of the same coin in their pockets than those who neglected them.

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A Good Thing—a strong cement for glass, wood, &c.—Steep isinglass 24 hours in common white brandy, then gently boil and keep stirring until the composition is well mixed, and a drop, if cooled, will become a strong jelly. Then strain it through a clean linen cloth into a vessel to be kept closely stopped. A gentle heat will dissolve this glue into a colorless fluid. Dishes of wood, glass, or earthen, if united with this cement, will break elsewhere rather than separate in the old break. In applying the cement, rub the edges which are to be united, then place them together, and hold them for two minutes, and the work is done.

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Valuable Recipe.—The worst cases of cholera morbus, dysentery, bloody flux, &c., that ever I saw, I have repeatedly cured in a few minutes, or hours, by a strong tea made of the bark of the sweet gum—taken green from the tree is best—steep a handful to a pint of water until the liquor is like good coffee—drink it clear or sweetened with loaf sugar, or add a glass of good brandy if the shock is very severe.

If not infallible, it is remarkable in its effects, and well worth being known and tried in every family.

Your friend, SOLON ROBINSON.

We can add our own testimony to the value of the sweet gum tea—having experienced amazing and speedy relief from its use in a violent case of dysentery which refused to yield to the usual remedies. We have also seen, in the last five years, its wonderful benefit in many other cases. We have used the decoction made from the bark both green and dried; and have discovered no material difference in the effect, both being efficacious. *Franklin Farmer.*